



SE5001A

Serial Device Server

User's Manual



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Important Announcement

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Preface

Purpose of the Manual

This manual supports you during the installation and configuring of the SE5001A Ethernet Serial Server only, as well as it explains some technical options available with the mentioned product. As such, it contains some advanced network management knowledge, instructions, examples, guidelines and general theories designed to help users manage this device and its corresponding software; a background in general theory is a must when reading it. Please refer to the Glossary for technical terms and abbreviations (if any).

Who Should Use This User Manual

This manual is to be used by qualified network personnel or support technicians who are familiar with network operations; it might be useful for system programmers or network planners as well. This manual also provides helpful and handy information for first time users. For any related problems please contact your local distributor, should they be unable to assist you, please redirect your inquiries to www.atop.com.tw or www.atop-tech.com.

Supported Platform

This manual is designed for the SE5001A Ethernet Serial Server and that model only.

Warranty Period

We provide a **5 year limited warranty** for SE5001A Ethernet Serial Server.

FCC WARNING

Class A for Serial Device Server (Model SE5001A)

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses, generates and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expenses.

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect other devices to this equipment by RS-232 or RS-485 ports.

Be cautioned that changes or modifications not expressly approved by the party responsible for compliance could void ones' authority to operate the equipment.

1 Introduction

The SE5001A Ethernet Serial device server acts as a gateway between Ethernet (TCP/UDP) and RS-232/RS-422/RS-485 communications. The information transmitted by SE5001A is transparent to both host computers (Ethernet) and serial devices (RS-232/RS-422/RS-485). Data coming from the Ethernet is sent to the designated RS-232/RS-422/RS-485 port and data received from RS-232/RS-422/RS-485 port is sent to the Ethernet transparently allowing bidirectional communication.

In the computer-aided manufacturing or industrial automation areas, SE5001A is used by field devices to directly connect to an Ethernet network. The user can then use a network application or use Virtual COM software to simulate a virtual com port in the PC to fetch serial data from SE5001A remotely over Ethernet.

With SE5001A, it is possible to communicate with a remote serial device in the LAN or even in the Internet, which dramatically increases reach in distance and scalability.

1.1 SE5001A Series Comparison

Model Name	Power Interface	Serial Interface	Firmware
SE5001A	TB3	DB9	Serial Device Server
SE5001A-TB	TB3	TB5	Serial Device Server

Note: The Adapter's DC connector has the following dimensions:

5.5mm inner radius, 2.1mm outer radius, and 9.5mm length

1.2 Packaging

The package should contain following items:

- Atop SE5001A Ethernet Serial device server x 1
- 5 pins Terminal Block for Serial Connector x 1 (SE5001A-TB only)
- 3 pins Terminal Block for Power Connector x 1
- Product CD containing configuration utility and documents x 1
- Wall-mounting screws x 2
- Atop Serial device server quick start guide x 1

Optional Accessories		
Name	Part Number	Description
DK-25	30200000000022G	DIN-Rail Kit
ADP-DB9(F)-TB5	59906231G	Female DB9 to Female 3.81mm TB5 Converter
US315-12(US-Y)	50500151120009G	Y-Type (BT1-10V) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, US plug
USE315-12(EU-Y)	50500151120019G	Y-Type (BT1-10V) power adaptor, 100-240VAC input, 1.25A @ 12VDC output, EU plug

1.3 Application Connectivity

TCP Server Mode : SE5001A can be configured as a TCP server in a TCP/IP Network to listen for an incoming TCP client connection to a serial device. After the connection is established between the serial device server and the host computer, data can be transmitted in both directions. This also applies to Virtual COM running in the server mode.

TCP Server Mode

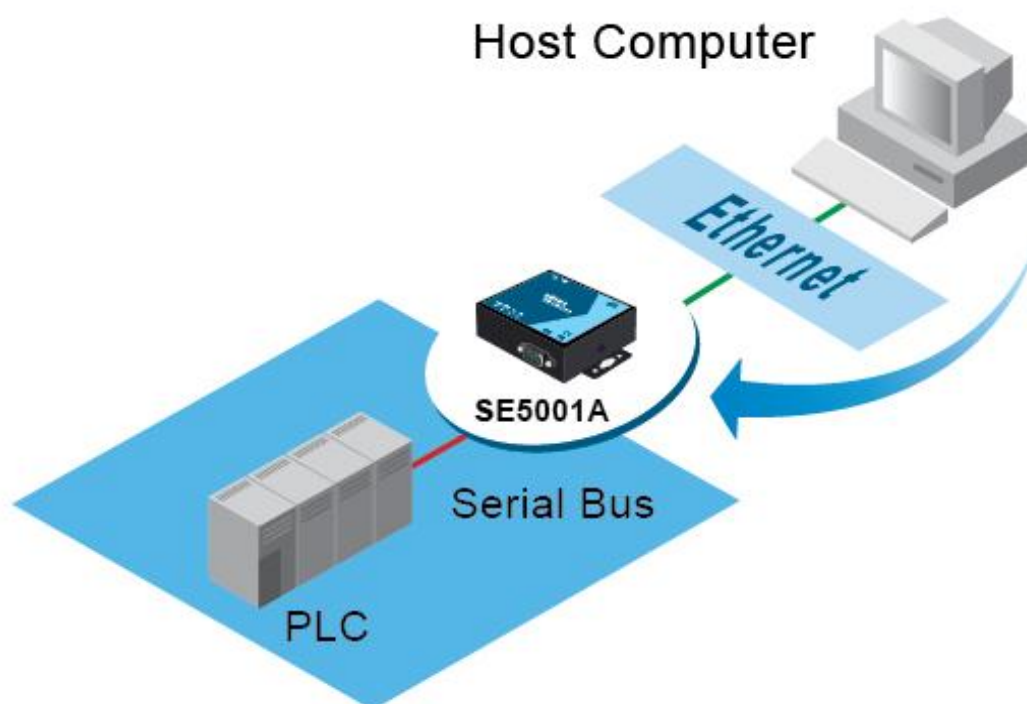


Figure 1.1 TCP Server Mode

TCP Client Mode

SE5001A can be configured as a TCP client in TCP/IP Network to establish a connection with a TCP server in the host computer. After the connection is established, data can be transmitted between a serial device and a host computer in both directions. This also applies to Virtual COM running in the client mode.

TCP Client Mode

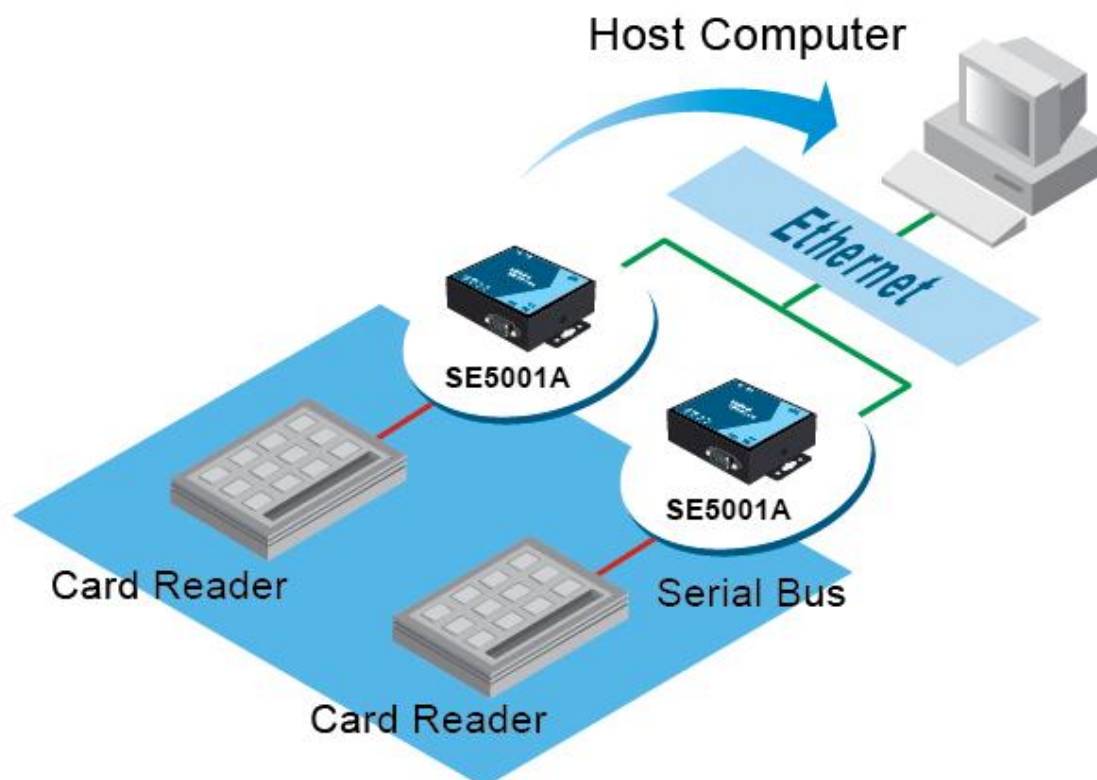


Figure 1.2 TCP Client Mode

UDP Mode

UDP is a faster but connectionless network protocol. It does not guarantee the delivery of network datagrams. SE5001A can be configured to transfer data using unicast or multicast UDP from the serial device to one or multiple host computers. Data can be transmitted between serial device and host computer in both directions.

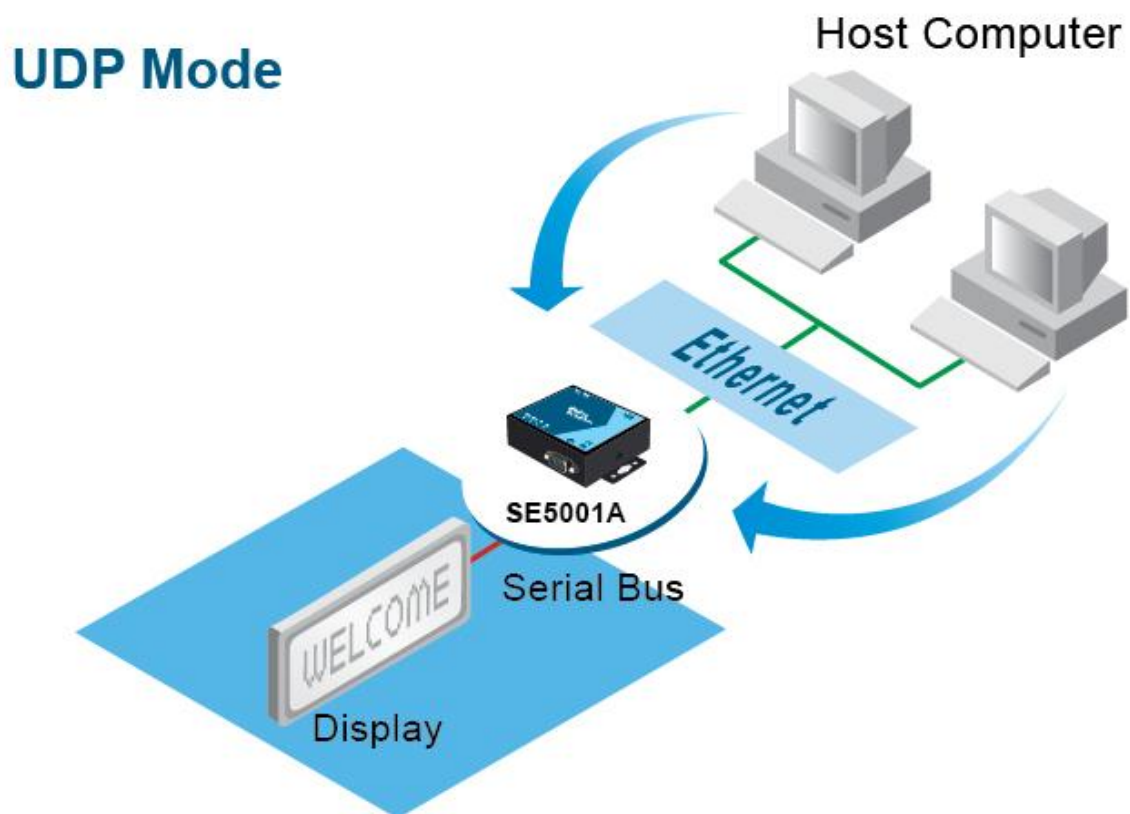


Figure 1.1 UDP Mode

Tunneling Mode

In the case that the serial device needs to communicate with each other without a host computer, two SE5001As can be paired together (pair connection) to communicate over TCP or UDP transparently. The serial device would be unaware of the change in the communication medium.

Tunnelling Mode

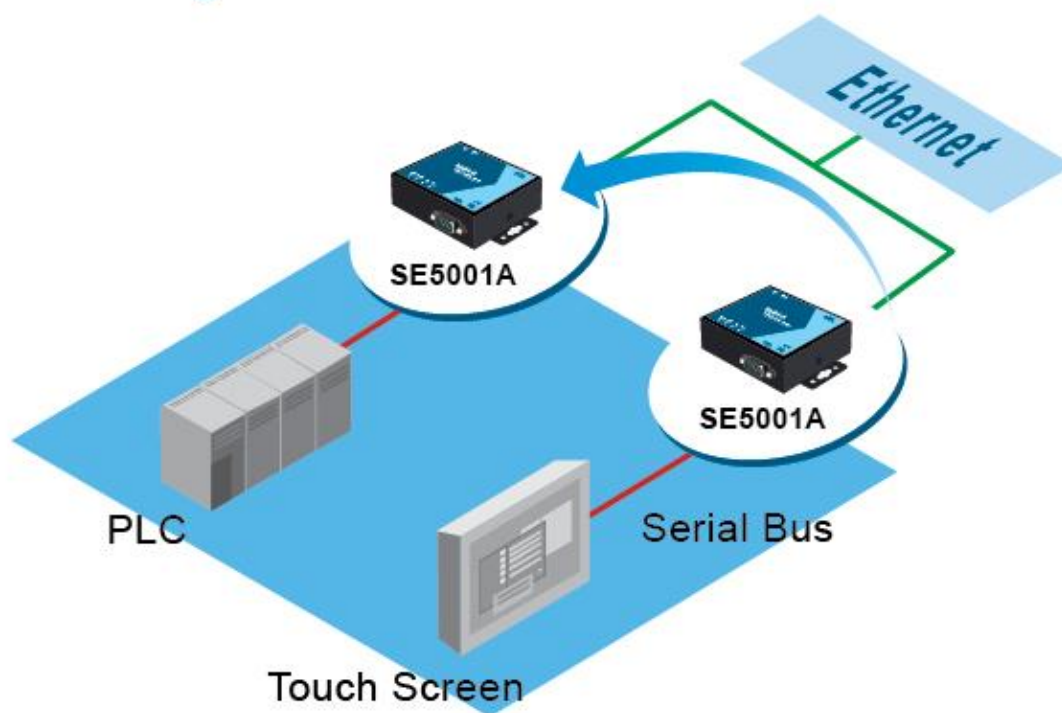
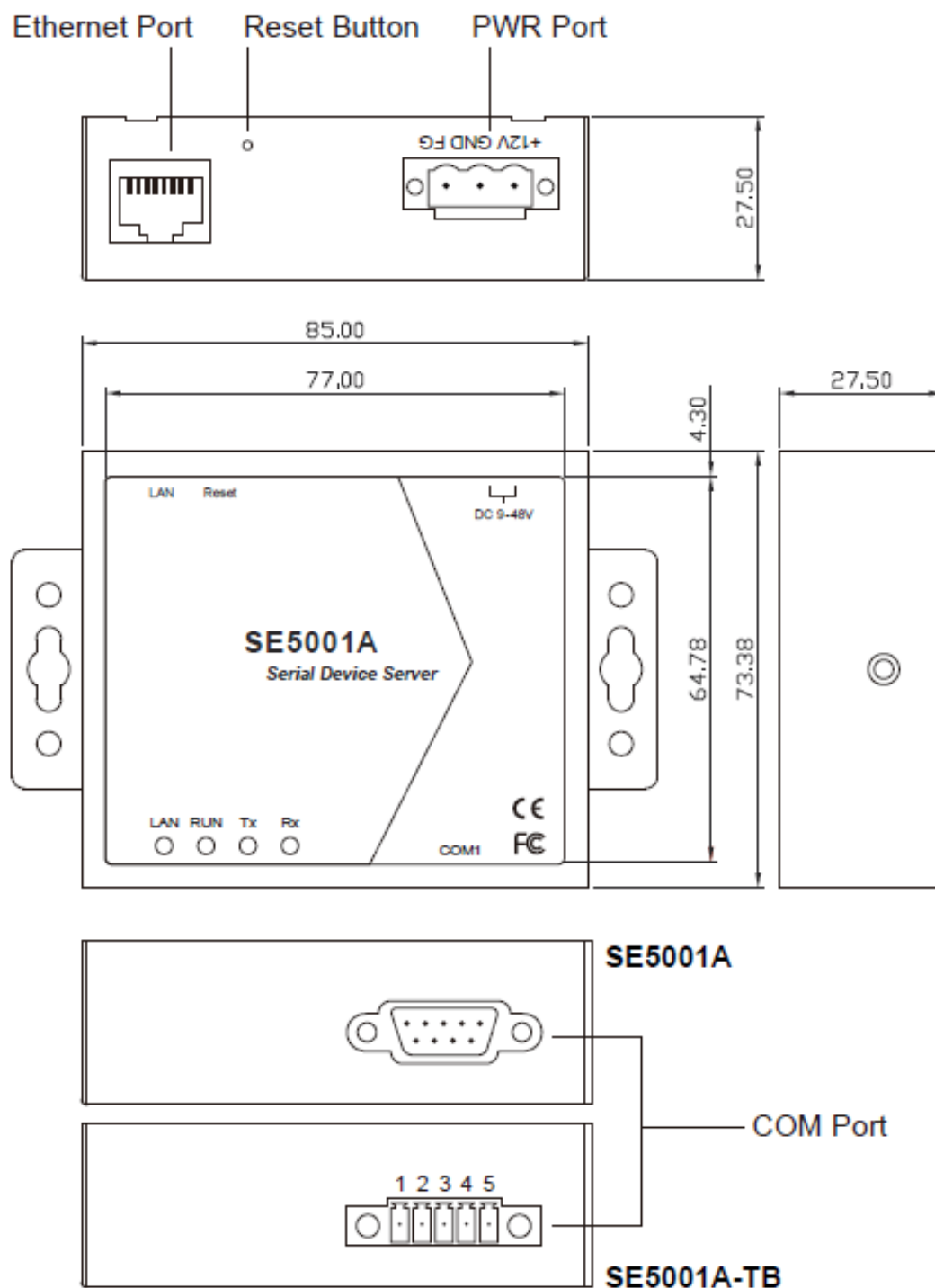


Figure 1.1 Tunneling Mode

2 Getting Started

2.1 Panel Layout



2.2 Pin Assignments

2.2.1 Serial Port

DB9 Pin Assignments

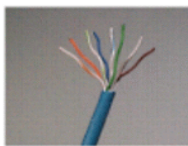
Pin#	RS-232 Full Duplex	2-Wire RS-485 Half Duplex	RS-422/4-Wire RS-485 Full Duplex
1	DCD	N/A	N/A
2	RXD	N/A	TXD+
3	TXD	DATA+	RXD+
4	DTR	N/A	N/A
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)
6	DSR	N/A	N/A
7	RTS	DATA-	RXD-
8	CTS	N/A	TXD-
9	N/A	N/A	N/A

TB5 Pin Assignments

Pin#	RS-232	2-Wire RS-485 Half Duplex	RS-422/4-Wire RS-485 Full Duplex
1	RxD	NC	T+
2	CTS	NC	T-
3	TxD	DATA+	R+
4	RTS	Data-	R-
5	SG (Signal Ground)	SG (Signal Ground)	SG (Signal Ground)

2.2.2 Ethernet Port

1. Category 5 UTP Ethernet cable.



2. RJ45 Connector.

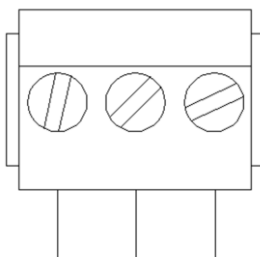


3. RJ45 Pin Assignment

Pin Assignment	568A Definition	568B Definition
Pin1	Green-White	Orange-White
Pin2	Green	Orange
Pin3	Orange-White	Green-White
Pin4	Blue	Blue
Pin5	Blue-White	Blue-White
Pin6	Orange	Green
Pin7	Brown-White	Brown-White
Pin8	Brown	Brown

One can choose either 568A or 568B definition. If one wants to make a crossover cable, one should use 568A and 568B definition respectively in each terminal of a UTP cable.

2.2.3 Power Port



F.G. VIN- VIN+

Note: Note: Reverse polarity protection is available in SE5001A, so VIN+ and VIN- could be reversed.

“ = “: Beep off

Table 1. Buzzer Message

Name	Color	Status	Description
PWR	Green	On	Device is powered on
		Off	Power is not connected
RUN	Green	On	AP firmware is disabled
		Blinking	AP firmware is running
		Off	Kernel firmware is damaged
LAN	Green	On	Ethernet is connected
		Blinking	Data is transmitting
		Off	Ethernet is disconnected
COM (Tx/Rx)	Green	Blinking	Data is transmitting
		Off	Data is not transmitting

3 Software Setup

SE5001A Ethernet Serial device server is shipped with default settings shown in the following table:

Property	Default Value
IP Address	10.0.50.100
Gateway	10.0.0.254
Subnet Mask	255.255.0.0
User Name	admin
Password	Null(leave it blank)
COM 1	9600,None, 8, 1, No flow control, buffer disabled, packet delimiter timer 2ms
Link 1	Type: TCP Server, Listen port 4660, Filter=0.0.0.0, Virtual COM disabled
SysName of SNMP	name
SysLocation of SNMP	location
SysContact of SNMP	contact

3.1 Configuration by Serial Manager

SE5001A could be configured by Serial Manager, for more information, refer to Serial Manager's manual.

3.2 Configuration by Telnet Utility

You can use a Telnet utility to change configuration settings of SE5001A by following steps :

3.2.1.Login to the System

->Open MS-DOS command prompt window or any other telnet application

->Telnet to SE5001A using command "**telnet IP_address**". (For example : "**telnet 10.0.50.100**" in MS-DOS command prompt window). After telnet into SE5001A, system will prompt for a password, the default password is blank. (Figure 3.1)

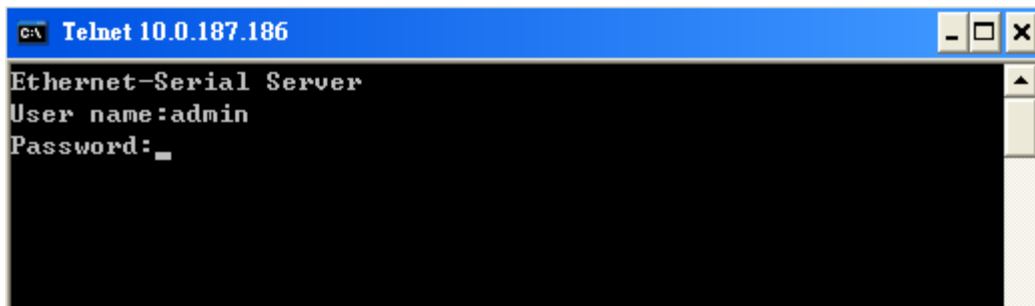
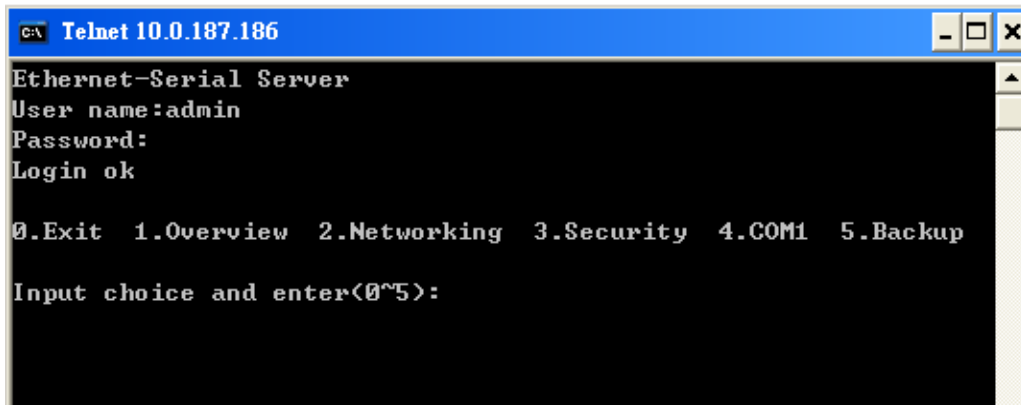


Figure 3.1 Login to the system

Note: Press the default button of SE5001A to reset the password to the default value.

1. After verifying the password, the following terminal screen appears (Figure 3.2).



```
C:\ Telnet 10.0.187.186

Ethernet-Serial Server
User name:admin
Password:
Login ok

0.Exit  1.Overview  2.Networking  3.Security  4.COM1  5.Backup

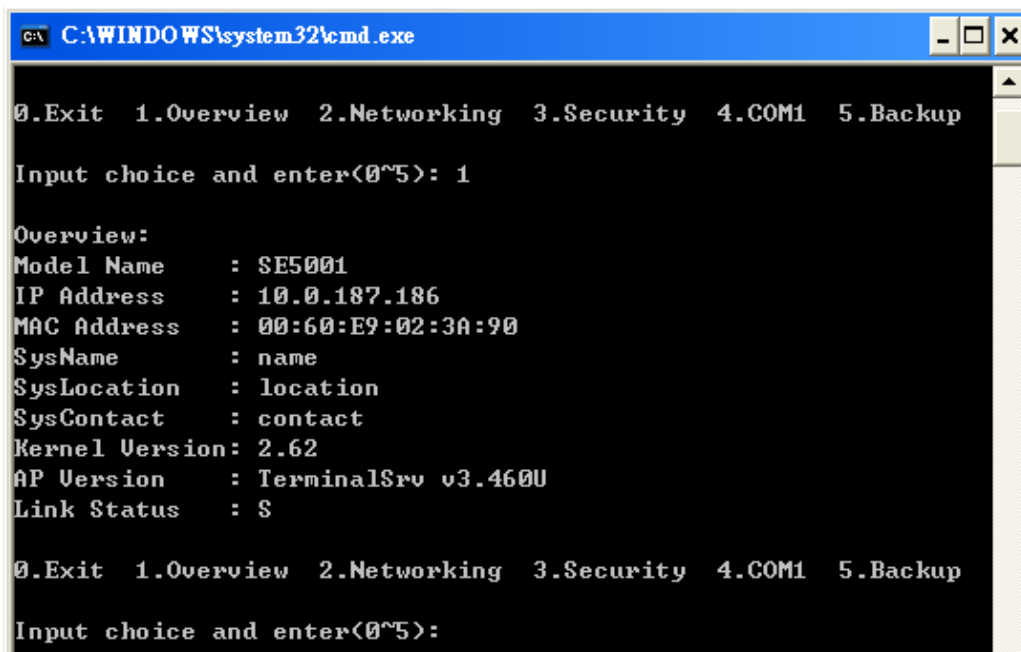
Input choice and enter(0~5):
```

Figure 3.2 Main menu

Note

1. If SE5001A does not receive any commands within **1 minute**, Telnet connection will terminate automatically.
2. After “0. Exit” is selected; the console will ask the user to save the configurations.
3. Changes to networking parameters will take effect only SE5001A is restarted.

->Select “1” from “Input choice and enter (0~4):” to enter “Overview” (Figure 3.3):



```
C:\WINDOWS\system32\cmd.exe

0.Exit  1.Overview  2.Networking  3.Security  4.COM1  5.Backup

Input choice and enter(0~5): 1

Overview:
Model Name      : SE5001
IP Address      : 10.0.187.186
MAC Address     : 00:60:E9:02:3A:90
SysName         : name
SysLocation     : location
SysContact      : contact
Kernel Version  : 2.62
AP Version      : TerminalSrv v3.460U
Link Status     : S

0.Exit  1.Overview  2.Networking  3.Security  4.COM1  5.Backup

Input choice and enter(0~5):
```

Figure 3.3 Overview

This page gives one the general information of SE5001A including IP and MAC address, SNMP information, kernel and AP version, and connection status of the device.

3.2.2. Networking

Select “2” from “Input choice and enter (0~4):” to enter Networking page as following (Figure 3.4):

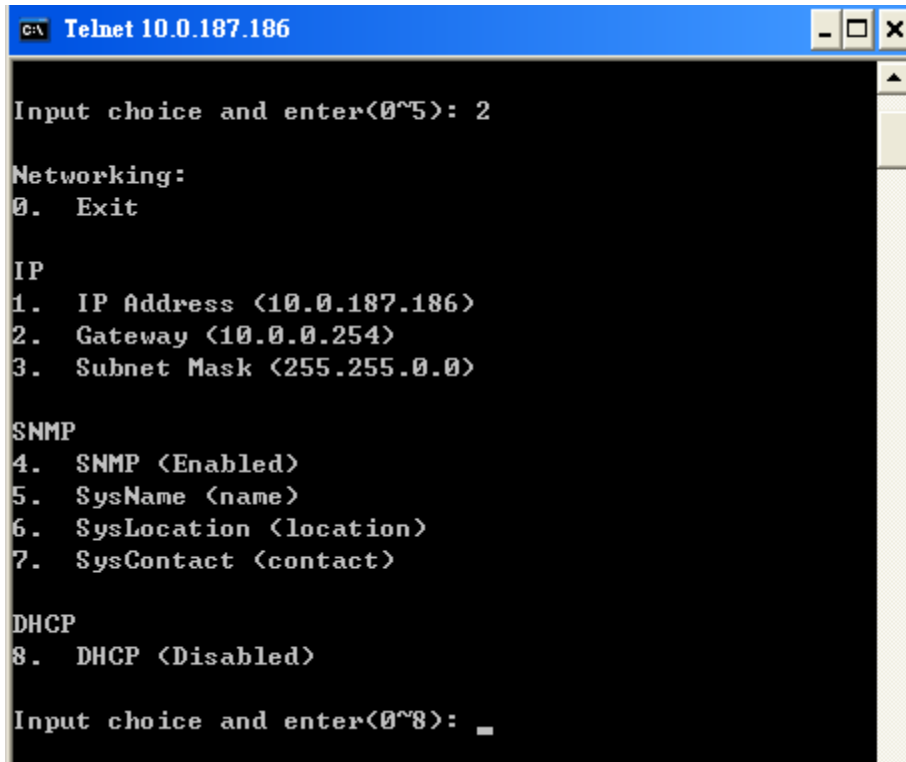


Figure 3.4 Network settings

Change network settings of the device including IP address, subnet mask, gateway IP address and SNMP information on this page. Please note that any changes made on this page won't take effect until the device is restarted.

Note: Press “ESC” key to return to the previous menu.

3.2.3. Change the Password

1. Select “3” from “Input choice and enter (0~4):” the following screen appears. (Figure 3.5)

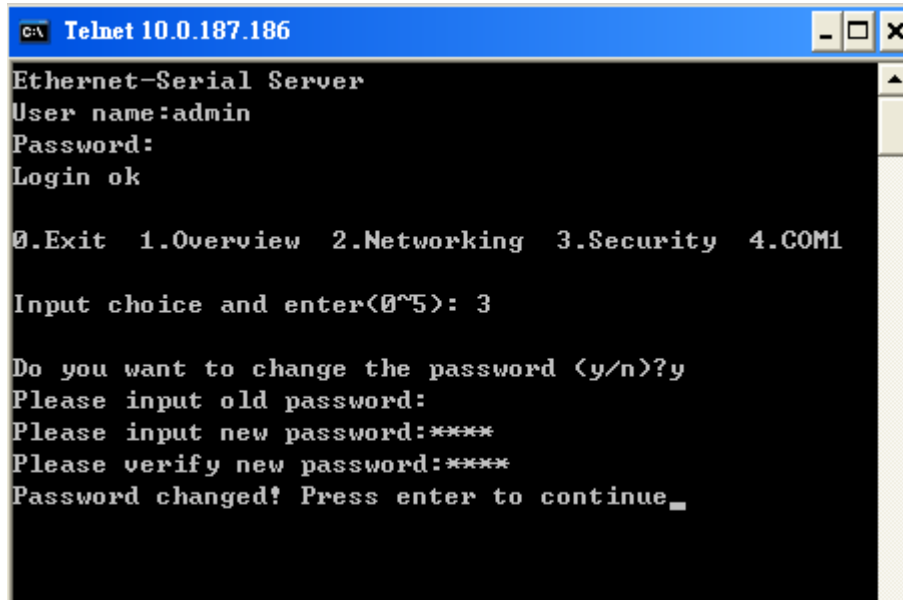


Figure 3.5 Change the Password

3.2.4.COM1 Setup

- Select “4” from “Input choice and enter (0~4):” the following screen appears (Figure 3.6):

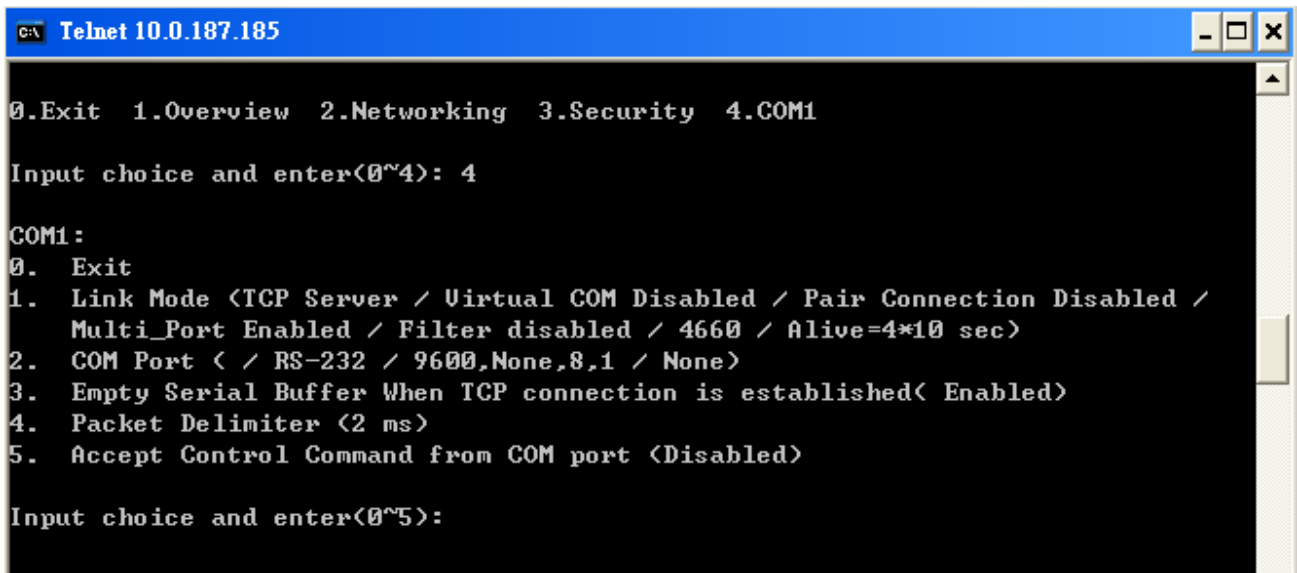


Figure 3.6 Com1 setup

This page includes the option to configure different COM1 parameters, including link mode, serial port settings, serial buffer, packet delimiter, and advanced control commands.

3.2.5. Configure SE5001A as TCP server

```

C:\ Telnet 10.0.187.185
1. Link Mode <TCP Server / Virtual COM Disabled / Pair Connection Disabled /
Multi_Port Disabled / Filter 10.0.160.88 / 4660 / Alive=2*10 sec>
2. COM Port < / RS-232 / 9600,None,8,1 / None>
3. Empty Serial Buffer When TCP connection is established< Enabled>
4. Packet Delimiter <2 ms>
5. Accept Control Command from COM port <Disabled>

Input choice and enter<0~5>: 1
Link mode
0.Exit
1.TCP server
2.TCP client
3.UDP
4.Virtual COM<Disabled>
5.Pair Connection<Disabled>

Input choice <0 ~ 5> and enter: 1
TCP server
Please input local port:4660
Do you want to enable Multi_Port <y/n>?n
Do you want to enable IP filter <y/n>?y
Please input FILTER_IP:10.0.160.88

Please input idle time to send TCP alive packet <2*10 sec>:
5
mode changed! Press enter to continue_

```

Figure 3.7 Link Mode: TCP Server Setup

- ➔ Type 1 (Link Mode) from “Input choice and enter (1~4):” of COM1
- ➔ Type 1 (TCP Server) in the “Input choice(1~5) and enter : ”
- ➔ Input local port in the “Please input local port : ”
- To Enable IP filter :
- ➔ Input y in the “Do one want to enable IP filter(y/n)?” to enable IP Filter. Otherwise input n.
- ➔ Input source IP in the “Please input Filter_IP : ”
- ➔ Double click “Enter” key
- ➔ Input idle time in “Please input idle time to send TCP alive packet(x*10sec) : ”(ex. Input 2 to change the sending TCP keep alive packet period to 20 sec)

Note:

1. IP filtering function is disabled if setting FILTER_IP to “0.0.0.0”.
2. IP filter is disabled by default
3. If IP filter is enabled, only source IP assigned can connect to SE5001A's COM.
4. If the multi-connection firmware is installed, SE5001A will prompt for “Multi_Port”, meaning multiple connection

3.2.6. Configure SE5001A as TCP Client

```

C:\ Telnet 10.0.187.185
Link mode
0.Exit
1.TCP server
2.TCP client
3.UDP
4.Virtual COM<Disabled>
5.Pair Connection<Disabled>

Input choice <0 ~ 5> and enter: 2
TCP client
Please input destination IP:10.0.160.88
Please input destination port:4660

Please select connected type <2>
<1>Connected always
<2>Trigger by receiving COM port data
2
Please input idle time to disconnect <3 sec, 1~255>:
10
Please input waiting time for error retrying <1 minute,1~255>:
1

Please input idle time to send TCP alive packet <1*10 sec>:
1
mode changed! Press enter to continue_

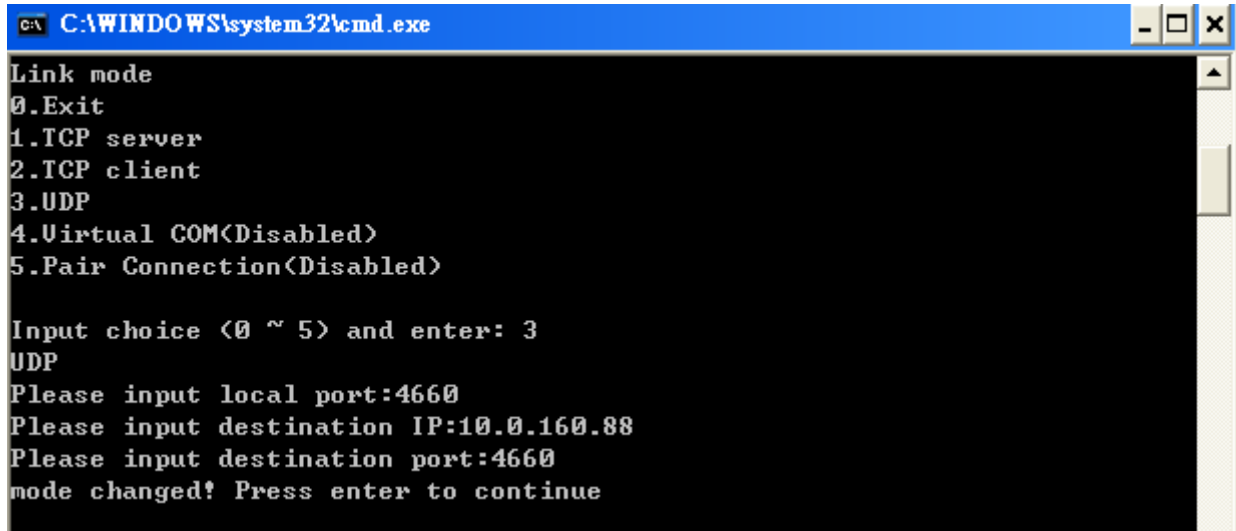
```

Figure 3.8 Link Mode: TCP Client Setup

- ➔ Type **2** in the “**Input choice(1~5) and enter :**”
 - ➔ Input destination IP in the “**Please input Destination IP :**”
 - ➔ Input destination port in the “**Please input Destination port :**”
 - ➔ Select TCP connection behavior: **1** for connect always, **2** for connect on serial data
- If **2** is selected, console will prompt for additional configurations.
- Input idle time to disconnect in the “**Please input idle time to disconnect(0sec , 1~255) :**” (Input **0** to disable; Input **2** to disconnect TCP connection after 2 seconds of serial Inactivity)
 - Input error retrying time in “**Please input waiting time for error retrying(0 minute,1~255) :**” (Input **0** to disable; Input **2** to try to connect to a TCP Server every 2 minutes)
- ➔ Input idle time in “**Please input idle time to send TCP alive packet(x*10sec) :**” (Input **2** to the send TCP keep alive packet every 20 seconds)

3.2.7. Configure SE5001A as UDP

UDP is a connectionless protocol. It is faster than TCP, but does not guarantee packet delivery to the remote host. Figure 3.9 shows how to setup UDP.



```
C:\WINDOWS\system32\cmd.exe

Link mode
0.Exit
1.TCP server
2.TCP client
3.UDP
4.Virtual COM(Disabled)
5.Pair Connection(Disabled)

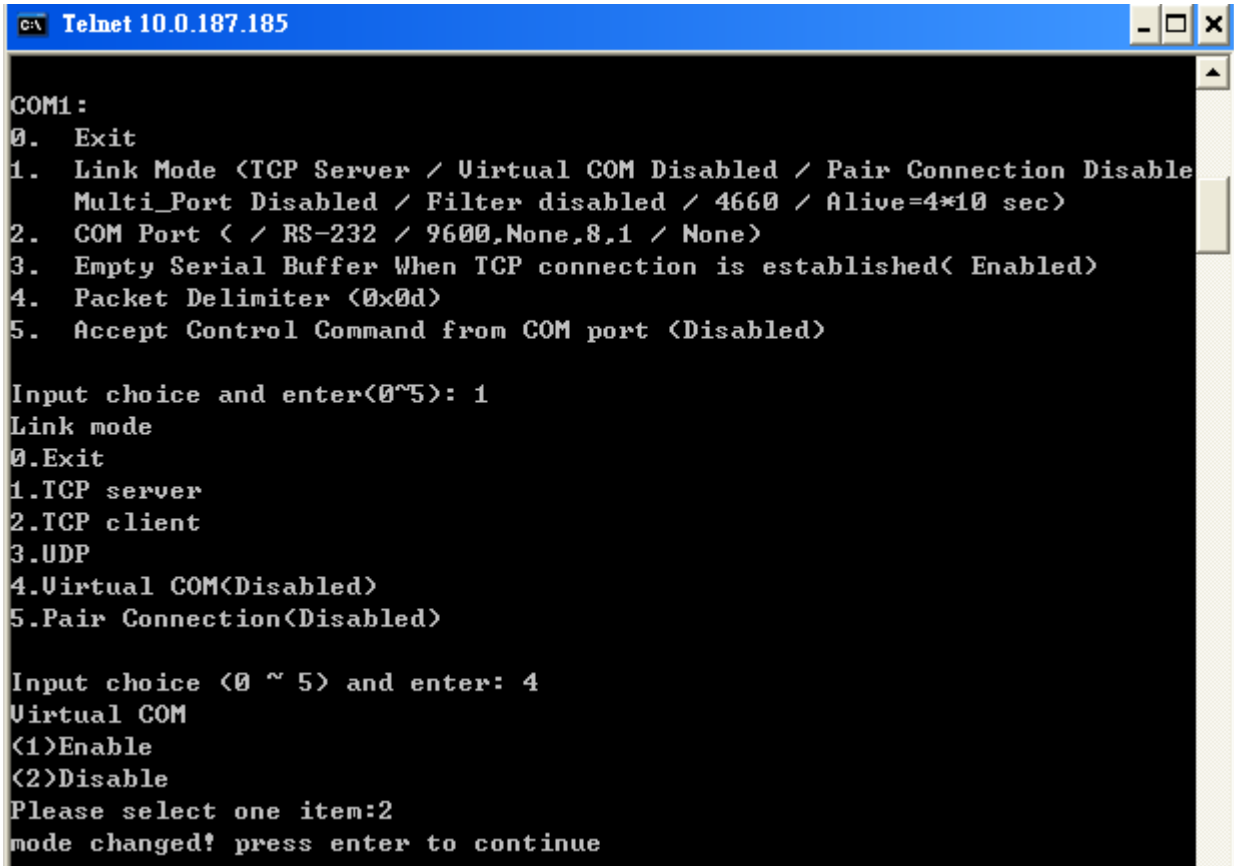
Input choice (0 ~ 5) and enter: 3
UDP
Please input local port:4660
Please input destination IP:10.0.160.88
Please input destination port:4660
mode changed! Press enter to continue
```

Figure 3.9 Link Mode: UDP Client Setup

- ➔ Type **3** in the “**Input choice(1~5) and enter :**”
- ➔ Input SE5001A's local listening port in the “**Please input local port :**”
- ➔ Input remote device's IP in the “**Please input Destination IP :**”
- ➔ Input remote device's listening port in the “**Please input Destination port :**”

3.2.8.Enable / Disable Virtual COM

Enable or disable Virtual COM on this page. For more information on how to setup Virtual COM on different operating systems, please refer to chapter [Using Virtual COM](#).



```
C:\ Telnet 10.0.187.185

COM1:
0. Exit
1. Link Mode <TCP Server / Virtual COM Disabled / Pair Connection Disable
  Multi_Port Disabled / Filter disabled / 4660 / Alive=4*10 sec>
2. COM Port < / RS-232 / 9600,None,8,1 / None>
3. Empty Serial Buffer When TCP connection is established< Enabled>
4. Packet Delimiter <0x0d>
5. Accept Control Command from COM port <Disabled>

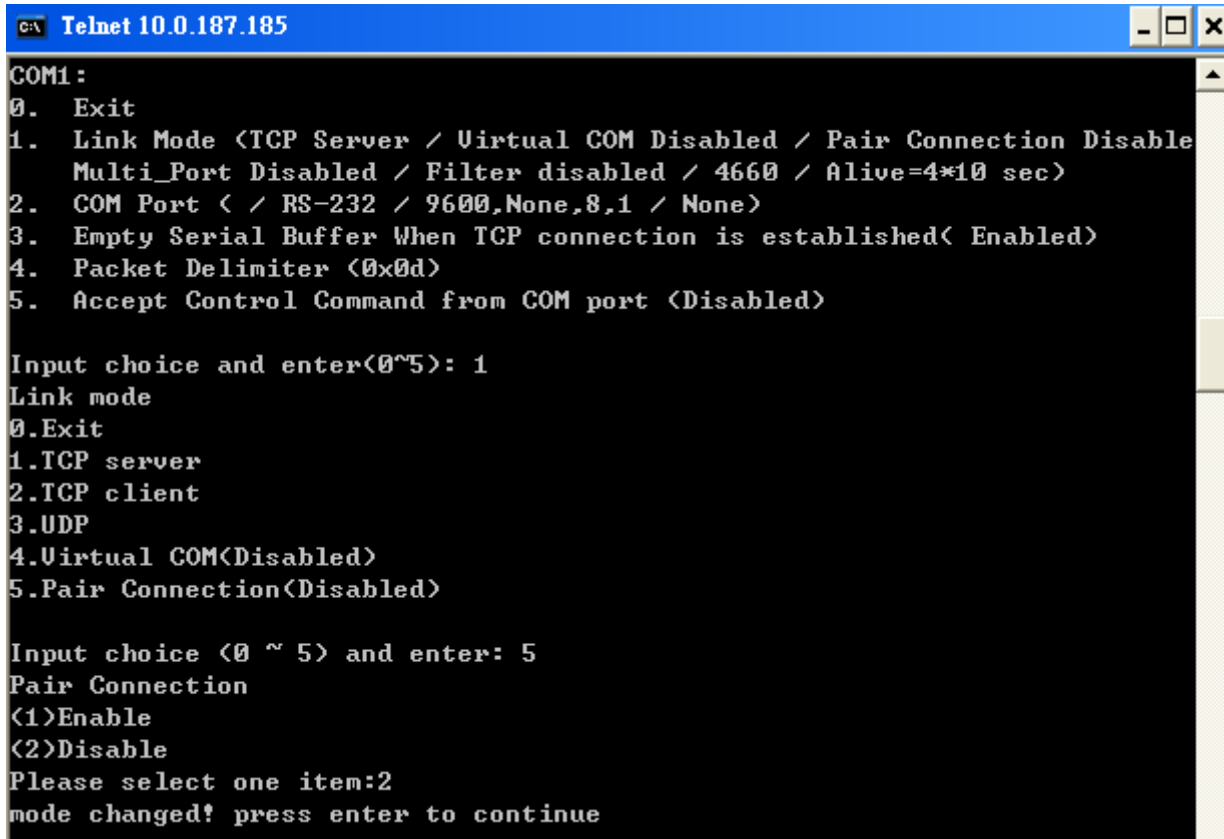
Input choice and enter(0~5): 1
Link mode
0.Exit
1.TCP server
2.TCP client
3.UDP
4.Virtual COM<Disabled>
5.Pair Connection<Disabled>

Input choice (0 ~ 5) and enter: 4
Virtual COM
<1>Enable
<2>Disable
Please select one item:2
mode changed! press enter to continue
```

Figure 3.10 Configure Virtual COM

3.2.9.Enable / Disable Pair Connection

Enable or disable "Pair Connection" on this page. For more information on how to configure two serial device servers to work in pair connection, please refer to the pair connection section [3.3.13](#).



```
C:\ Telnet 10.0.187.185
COM1:
0. Exit
1. Link Mode <TCP Server / Virtual COM Disabled / Pair Connection Disable
Multi_Port Disabled / Filter disabled / 4660 / Alive=4*10 sec>
2. COM Port < / RS-232 / 9600,None,8,1 / None>
3. Empty Serial Buffer When TCP connection is established< Enabled>
4. Packet Delimiter <0x0d>
5. Accept Control Command from COM port <Disabled>

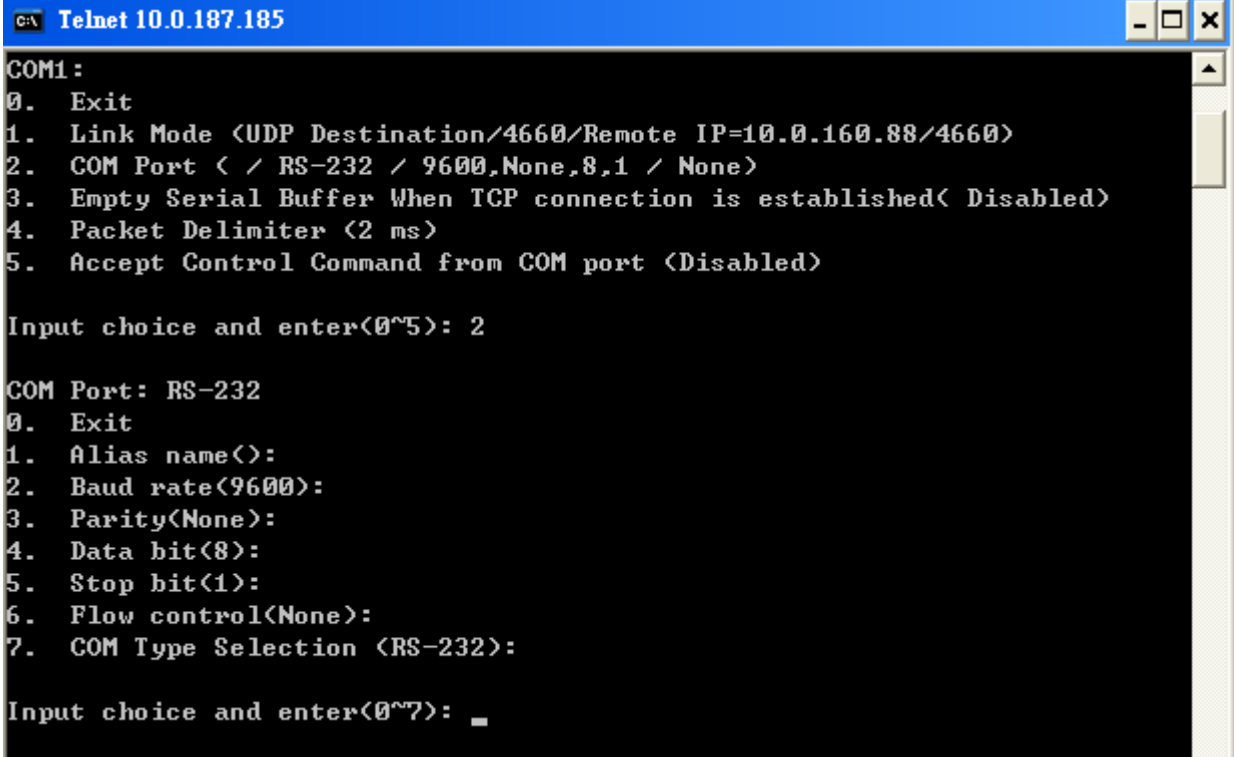
Input choice and enter<0~5>: 1
Link mode
0.Exit
1.TCP server
2.TCP client
3.UDP
4.Virtual COM<Disabled>
5.Pair Connection<Disabled>

Input choice <0 ~ 5> and enter: 5
Pair Connection
<1>Enable
<2>Disable
Please select one item:2
mode changed! press enter to continue
```

Figure 3.11 Configure Pair Connection

3.2.10. COM Port Setting

Type 2 from “**Input choice and enter (1~4):**” of COM1, the following screen appears. It is possible to give the COM port alias name, set the baud rate and parity, determine number of data bit and stop bit, and the type of flow control to use here (Figure 3.12).



```
C:\ Telnet 10.0.187.185
COM1:
0. Exit
1. Link Mode <UDP Destination/4660/Remote IP=10.0.160.88/4660>
2. COM Port < / RS-232 / 9600, None, 8, 1 / None>
3. Empty Serial Buffer When TCP connection is established< Disabled>
4. Packet Delimiter <2 ms>
5. Accept Control Command from COM port <Disabled>

Input choice and enter<0~5>: 2

COM Port: RS-232
0. Exit
1. Alias name<>:
2. Baud rate<9600>:
3. Parity<None>:
4. Data bit<8>:
5. Stop bit<1>:
6. Flow control<None>:
7. COM Type Selection <RS-232>:

Input choice and enter<0~7>: _
```

Figure 3.12 COM Port Settings

3.2.11. Emptying Serial Buffer when TCP connection is established

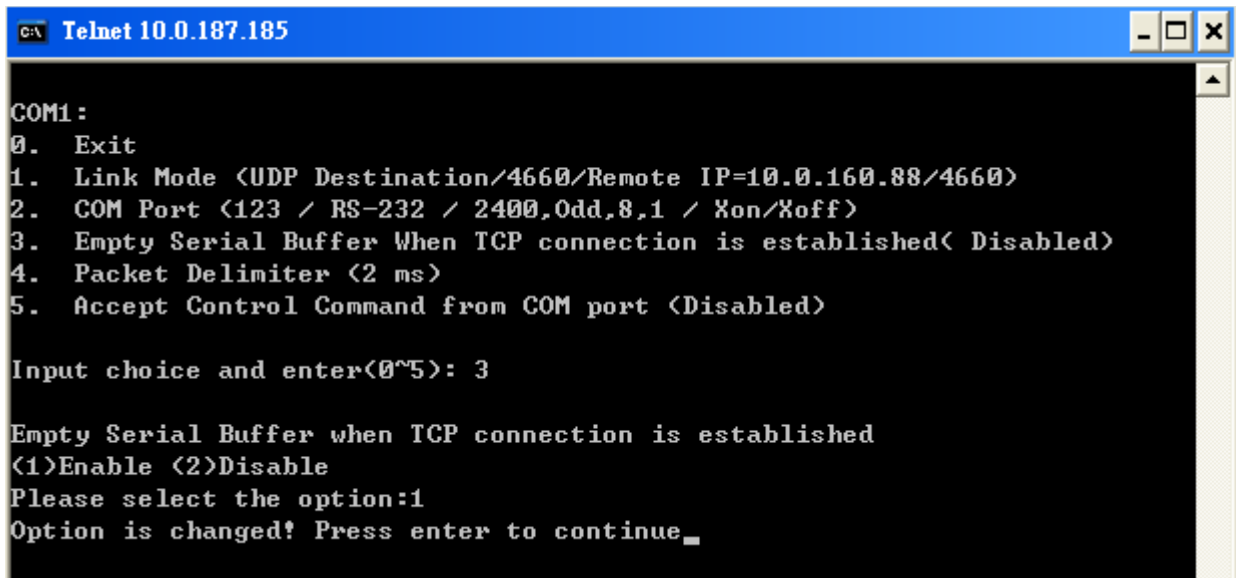
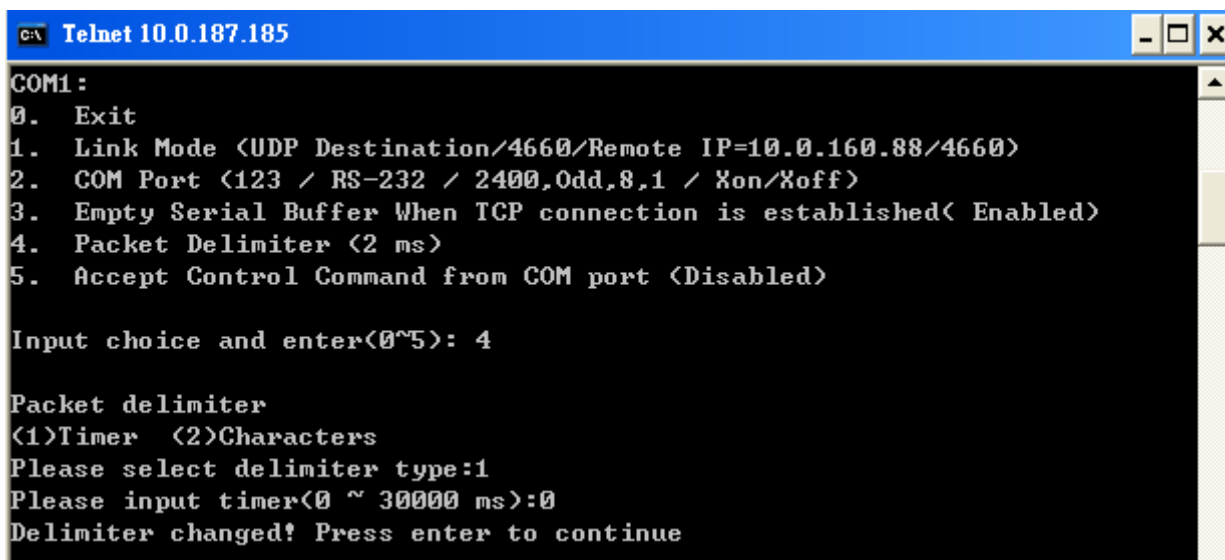


Figure 3.13 Com Port: Enabling Serial Buffer

Type **3** from “**Input choice and enter (1~4):**” of COM1, by default COM port serial buffer is enabled meaning that once a TCP connection is established, old serial data received from serial device before the connection will be emptied. If this option is disabled, SE5001A will keep old serial data when the connection is broken (Figure 3.13).

3.2.12. Setting Packet Delimiter

Packet delimiter is a way of packaging serial data. It can prevent serial data from being truncated by packing them in the same Ethernet packet. SE5001A provides two kinds of packet delimiter: Timer and Character. The default timer is 2 ms (0ms to disable this function). This means that if SE5001A does not receive new serial data within 2ms, it will send out all the serial data in buffer in one packet over Ethernet. The way to change the delimiter timer is shown in the following figure (Figure 3.14):



```

C:\ Telnet 10.0.187.185
COM1:
0. Exit
1. Link Mode <UDP Destination/4660/Remote IP=10.0.160.88/4660>
2. COM Port <123 / RS-232 / 2400,Odd,8,1 / Xon/Xoff>
3. Empty Serial Buffer When TCP connection is established< Enabled>
4. Packet Delimiter <2 ms>
5. Accept Control Command from COM port <Disabled>

Input choice and enter<0~5>: 4

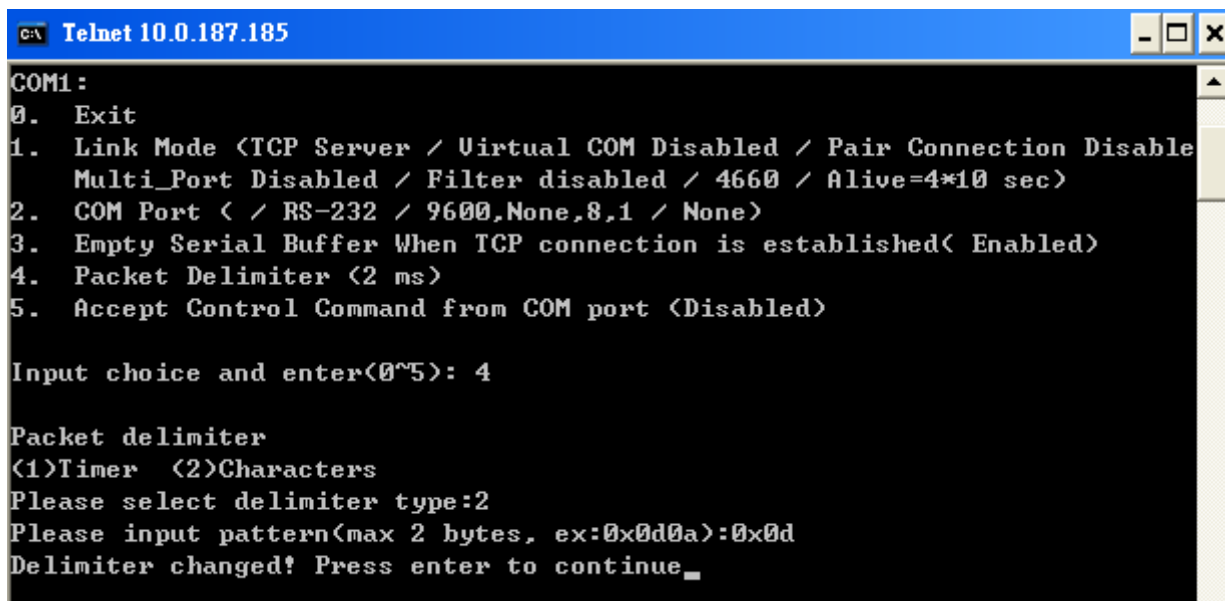
Packet delimiter
<1>Timer <2>Characters
Please select delimiter type:1
Please input timer<0 ~ 30000 ms>:0
Delimiter changed! Press enter to continue

```

Figure 3.14 Setting packet delimiter timer

Another kind is character delimiter. If the character delimiter is set to 0x0d, this means SE5001A will send out all the serial data in buffer in one packet over Ethernet only if it reads 0x0d. The following figure shows how to configure character delimiter:

(Figure 3.15)



```

C:\ Telnet 10.0.187.185
COM1:
0. Exit
1. Link Mode <TCP Server / Virtual COM Disabled / Pair Connection Disable
Multi_Port Disabled / Filter disabled / 4660 / Alive=4*10 sec>
2. COM Port < / RS-232 / 9600,None,8,1 / None>
3. Empty Serial Buffer When TCP connection is established< Enabled>
4. Packet Delimiter <2 ms>
5. Accept Control Command from COM port <Disabled>

Input choice and enter<0~5>: 4

Packet delimiter
<1>Timer <2>Characters
Please select delimiter type:2
Please input pattern<max 2 bytes, ex:0x0d0a>:0x0d
Delimiter changed! Press enter to continue

```

Figure 3.15 Setting Packet Delimiter: Character Pattern

3.2.13. Accept Control Command from COM port

SE5001A can also accept serial control commands (RFC2217) directly from the COM port. For more details and information about this function, please contact our Technical Support.

3.2.14. Backup EEPROM to Flash

Select "5" from "**Input choice and enter (0~5):**" the following screen should appear (Figure 3.16):

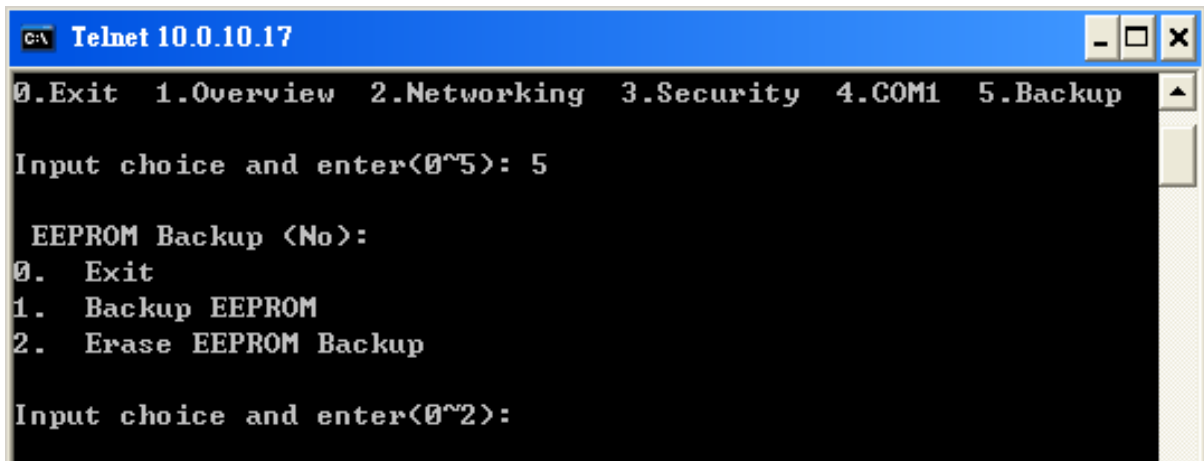


Figure 3.16 Backup EEPROM to Flash

- Type 1 from "**Input choice and enter (0~2):**" to back up the settings from the EEPROM to the Flash. SE5001A would then show "**EEPROM Backup (Yes)**".
- Type 2 from "**Input choice and enter (0~2):**" to erase the settings stored in the Flash. SE5001A would then show "**EEPROM Backup (No)**".

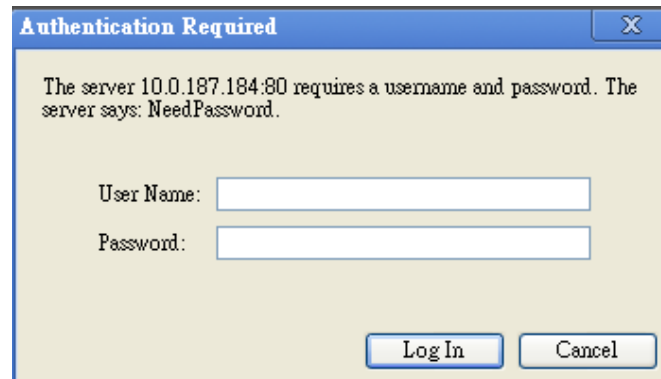
3.3 Configuration Using Web Browser

1. Make sure the PC is located in the same network sub-net as SE5001A
2. Open a web browser, then Enter in the IP address of SE5001A. Default user name is **admin** and default password is **null (leave it blank)**.
3. SE5001A's **network**, **link mode** and **COM ports settings** can be configured in different web pages.
4. Click "**Save Configuration**" to save settings.
5. Click "**Restart**" button in "**System**" link to make the change effective if necessary.

It is also possible to modify various settings through the web server interface. To do so, please follow the steps below.

3.3.1. Log in to the System

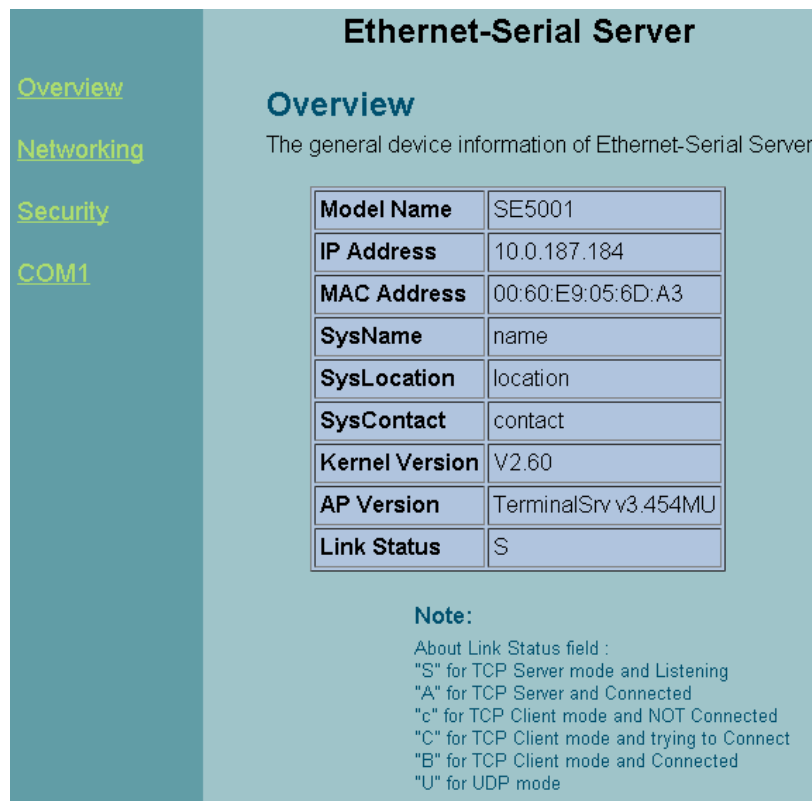
1. After opening the web browser, ex. Microsoft IE, Firefox or any other web browser, enter the IP address of SE5001A in the URL bar. **Example: `http://10.0.50.100`**
2. The following authentication screen should appear. Enter the **user name** and **password** then click on "**OK / Log in**". The default user name is **admin** and password is Null (*Leave it blank*).



The image shows a web browser window displaying an "Authentication Required" dialog box. The dialog box has a title bar with "Authentication Required" and a close button (X). The main text inside the dialog box reads: "The server 10.0.187.184:80 requires a username and password. The server says: NeedPassword." Below this text, there are two input fields: "User Name:" and "Password:". At the bottom right of the dialog box, there are two buttons: "Log In" and "Cancel".

Figure 3.17 Login Security Check

3. The following overview page should show (Figure 3.18). Click on the links on the left to go to different configuration pages, which are "**Networking**", "**Security**", and "**COM**".



The image shows a web browser window displaying the "Ethernet-Serial Server" Overview page. The page has a teal sidebar on the left with links: "Overview", "Networking", "Security", and "COM1". The main content area has a title "Ethernet-Serial Server" and a subtitle "Overview". Below the subtitle, it says "The general device information of Ethernet-Serial Server." There is a table with the following data:

Model Name	SE5001
IP Address	10.0.187.184
MAC Address	00:60:E9:05:6D:A3
SysName	name
SysLocation	location
SysContact	contact
Kernel Version	V2.60
AP Version	TerminalSrv v3.454MU
Link Status	S

Below the table, there is a "Note:" section with the following text:

About Link Status field :
"S" for TCP Server mode and Listening
"A" for TCP Server and Connected
"c" for TCP Client mode and NOT Connected
"C" for TCP Client mode and trying to Connect
"B" for TCP Client mode and Connected
"U" for UDP mode

Figure 3.18 Overview

3.3.2. Networking Setup

Configure IP, SNMP, and alert settings on this page. Please fill in the IP information in the fields under the TCP/IP header (Figure 3.19). Alternatively, enable DHCP to obtain IP address, gateway and subnet mask from a DHCP server automatically.

Ethernet-Serial Server

TCP/IP

To configure network settings of Ethernet-Serial Server. After saving configuration you have to restart the device to make the settings effective.

DHCP	<input type="checkbox"/> Obtain an IP automatically
IP Address	10 . 0 . 187 . 185
Default Gateway	10 . 0 . 0 . 254
Subnet Mask	255 . 255 . 0 . 0

Figure 3.19 IP Information Setup

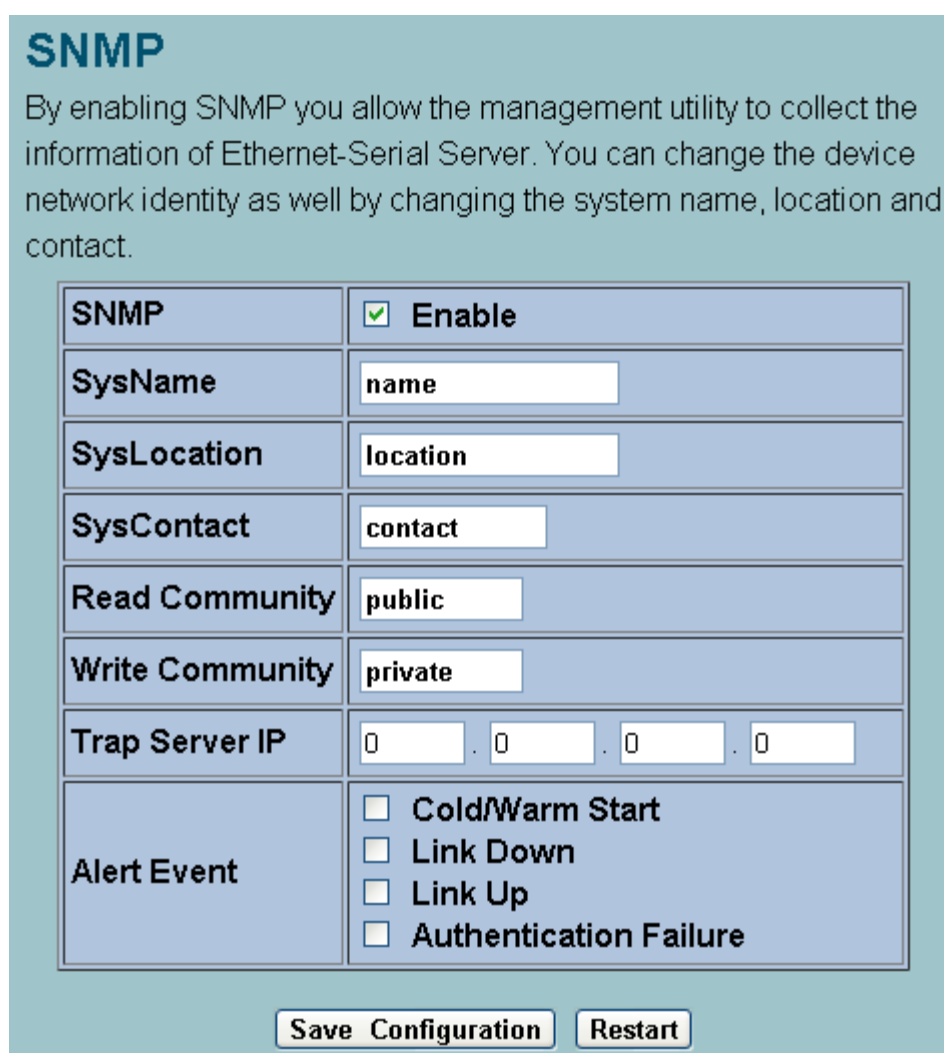
Enable SNMP and Alert Events by checking “**Enable**” (Figure 3.20). Fill in SNMP information in the fields under the SNMP header. Enable different Alert Events to send these events to a SNMP Trap Server.

Cold/Warm Start: Triggers when the device is rebooted from the application level or physical level.

Link Down: Triggers when the TCP connection of the designated COM port is closed

Link Up: Triggers when the TCP connection of the designated COM port is established

Authentication Failure: Triggers when the username/password entered in the Telnet console or the WebUI is incorrect.



The image shows a web interface for configuring SNMP. It has a title 'SNMP' and a descriptive paragraph. Below is a form with several fields: 'SNMP' (checked 'Enable'), 'SysName' (text 'name'), 'SysLocation' (text 'location'), 'SysContact' (text 'contact'), 'Read Community' (text 'public'), 'Write Community' (text 'private'), 'Trap Server IP' (four numeric input boxes), and 'Alert Event' (four checkboxes: 'Cold/Warm Start', 'Link Down', 'Link Up', and 'Authentication Failure'). At the bottom are two buttons: 'Save Configuration' and 'Restart'.

SNMP	<input checked="" type="checkbox"/> Enable
SysName	name
SysLocation	location
SysContact	contact
Read Community	public
Write Community	private
Trap Server IP	0 . 0 . 0 . 0
Alert Event	<input type="checkbox"/> Cold/Warm Start <input type="checkbox"/> Link Down <input type="checkbox"/> Link Up <input type="checkbox"/> Authentication Failure

Save Configuration Restart

Figure 3.20 SNMP Setup

After all the settings are entered, please click on the “**Save Configuration**” button to save the changes. Note that the settings would become active only after SE5001A is restarted.

3.3.3. Security Setup

Change the login password on this page (Figure 3.21).

Security

The default password is null, you can change the password by filling in the new password to New Password and Verified Password fields, be aware that password is case sensitive.

Old Password
New Password
Verified Password

Save Configuration

Have Backup

Backup EEPROM

Erase Backup

Figure 3.21 Security Setup

Please enter the old password in the “**Old Password**” field and enter the new password in the “**New Password**” and the “**Verified Password**” fields. Then click on the “**Save Configuration**” to save and apply the new password.

Note: Press the reset button next to the RJ-45 Jack to reset the settings back to the default value.

3.3.4.Backup EEPROM to Flash

This backup function could recover settings from the Flash to the EEPROM if the settings in the EEPROM are lost. If SE5001A detects that there is an EEPROM backup in the flash. It will compare the backup values in the Flash and EEPROM. If the values do not match, it will write the backup settings in the Flash to the EEPROM. To enable this function, follow Figure 3.21 in the Security Settings.

- Click on **Backup EEPROM** to back up the settings from the EEPROM to the Flash. SE5001A would then show **Have Backup**.
- Click on **Erase Backup** to erase the settings stored in the Flash. SE5001A would then show **No Backup**.

3.3.5.Link Mode Configuration

SE5001A supports different Link Modes, which are TCP Server, TCP Client, and UDP (Figure 3.22). Under the three Link Modes, TCP Server can support Virtual COM, Pair Connection, or Reverse Telnet applications. TCP Client can support Virtual COM or Pair Connection application. If none of the application is enabled, the SE5001A will run in RAW mode. In the upcoming sections, we will discuss how to setup different Link Modes properly.

LINK1
To choose specific working mode for COM port.

☒ TCP Server ☐ TCP Client ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Reverse Telnet Mode	<input type="checkbox"/> Enable

Figure 3.22 Link Modes

3.3.6.Link Mode: Configure SE5001A as a TCP Server

SE5001A defaults in TCP Server mode, there are additional connection settings that can be configured (Figure 3.23). By selecting the TCP Server mode, a TCP Client program should be prepared to connect to SE5001A.

- ➔ Click on the **“COM1”** link on the left hand side.
- ➔ Select **TCP Server**. TCP Server is the default link mode.
- ➔ Enter the **Local Listening Port**. This is the port specified in the TCP Client program connecting to the serial device server. The default local port is 4660.
- ➔ **IP Filter**: Only the designated IP address will be able to access the COM port if this option is enabled. This option is disabled by default.
- ➔ **TCP Keep-Alive**: Specify the interval in the **“Idle Time Before Sending TCP Alive Packet”** to force SE5001A to send TCP Keep-Alive packets in the set interval to prevent disconnection from the client. Note that this field has a multiplier of 10, so the default value 4 means to send Keep-Alive packets every 40 seconds.
- ➔ **TCP Inactivity Timeout**: Specify the value in **“TCP Inactivity Time Before Disconnect”** to force SE5001A actively close a TCP connection after some specific inactivity time (no packets). The default value is 0, which means the SE5001A would never actively close an established connection.

- Scroll to the bottom of the page and click on “**Save Configuration**” button to save the changes.
- Go to the **Application Configuration** section starting from 3.3.9 to apply Virtual COM, Pair Connection, or Reverse Telnet application if applicable. Otherwise go to the **COM Configuration** (section 3.3.19) for serial settings directly.

LINK1
To choose specific working mode for COM port.

☒ TCP Server ☐ TCP Client ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Reverse Telnet Mode	<input type="checkbox"/> Enable

Local Listening Port	4660
IP Filter	<input type="checkbox"/> Enable, Source IP : <input type="text"/>
Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)

Figure 3.23 TCP Server Setup

Note:

LINK1 is associated with COM1; LINK2 is associated with COM2, and so on.

3.3.7.LINK Mode: Configure SE5001A as a TCP Client

By selecting the TCP Client mode, it means that a TCP Server program should be prepared to connect to SE5001A. Figure 3.24 shows all the settings provided for the TCP Client.

- Click on the “**COM1**” link on the left hand side.
- Select **TCP Client**.
- Enter the preferred **Destination IP** and **Port**. This should match the IP settings of the TCP Server program.
- **Connect Rule**: Decide how SE5001A should connect to the TCP Server here. If SE5001A should always keep the connection, select **TCP Connect on Power-on**. This means SE5001A would connect to the TCP Server program when SE5001A is powered on. By default, **TCP Connect on Any Serial Character** is selected. This means that SE5001A would only connect to the TCP Server program when it receives data from its serial interface. If **TCP Connect on Any Serial Character** is selected, there are two additional options to change, which are **Serial Inactivity Time Before Disconnect** and **Waiting Time Between Re-connect Attempts**. **Serial Inactivity Time Before Disconnect** determines how long SE5001A should wait before closing a TCP connection if there is no incoming serial data. The default value is 40 seconds. **Waiting Time Between Re-connect Attempts** determines the time SE5001A should wait before it tries to establish a connection with a TCP Server again if it fails to connect to the TCP Server. The default value is 1 minute.
- **TCP Keep-Alive**: Specify the interval in the “**Idle Time Before Sending TCP Alive Packet**” to force SE5001A to send TCP Keep-Alive packets in the set interval to prevent disconnection from the client. Note that this field has a multiplier of 10, so the default value 4 means to send Keep-Alive packets every 40 seconds.
- **TCP Inactivity Timeout**: Specify the value in “**TCP Inactivity Time Before Disconnect**” to force SE5001A actively close a TCP connection after some specific inactivity time (no packets). The default value is 0, which means the SE5001A would never actively close an established connection.
- Scroll to the bottom of the page and click on “**Save Configuration**” button to save the changes.
- Go to the **Application Configuration** section starting from 3.3.11 to apply Virtual COM, Pair Connection, or Reverse Telnet application if applicable. Otherwise go to the **COM Configuration** (section 3.3.19) for serial settings directly.

LINK1

To choose specific working mode for COM port.

☐ TCP Server
 ☒ TCP Client
 ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable

Destination IP, Destination Port	IP : <input type="text" value="10.0.160.88"/> Port : <input type="text" value="4660"/>
Connecting Rule of TCP Client	<input type="radio"/> TCP Connect On Power-on <input checked="" type="radio"/> TCP Connect On Any Serial Character
Serial Inactivity Time Before Disconnect	<input type="text" value="40"/> sec (1~255)
Waiting Time Between Re-connect Attempts	<input type="text" value="1"/> min (0~255, 0:Disable)
Idle Time Before Sending TCP Alive Packet	<input type="text" value="4"/> *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	<input type="text" value="0"/> sec (0~255, 0:Disable)

Figure 3.24 TCP Client Setup

3.3.8.Link Mode: Configure SE5001A in UDP

SE5001A also supports connectionless UDP protocol compared to the connection-oriented TCP protocol. Please be aware that even though UDP provides better efficiency in terms of response time and resource usage, it does not guarantee data delivery. It is recommended to utilize UDP only with cyclic polling protocols where each request is repeated and independent, such as Modbus Protocol. Figure 3.25 shows the UDP settings.

- Click on the “**COM1**” link on the left hand side.
- Select **UDP**.
- **Destination IP and Port:** Specify the **Begin** and **End IP** here. Four groups of range IPs are allowed. This is the **IP** address of the UDP program and the **Port** it is listening to. Note that the maximum number of UDP nodes that SE5001A can handle would highly depend on the traffic load. *We have tested that SE5001A can handle up to 32 UDP nodes (baud rate 9600 bps, request interval 100ms, and data length 30bytes).*
- Enter the **Local Listening Port**. This is the port that SE5001A should listen to. Match this setting in the UDP program (usually called destination port in the UDP program).
- Scroll to the bottom of the page and click on “**Save Configuration**” button to save the changes.
- Go to the section [3.3.16](#) to apply Pair Connection application if applicable. Otherwise go to the **COM Configuration** (section [3.3.19](#)) for serial settings directly.

Ethernet-Serial Server

LINK1
To choose specific working mode for COM port.

☐ TCP Server
 ☐ TCP Client
 ☒ UDP

Destination IP, Destination Port	..	Begin IP	- ..	End IP	: ..	Port ..
		10.0.160.1	-	10.0.160.10	:	4660
			-		:	
			-		:	
			-		:	

Local Listening Port	4660
-----------------------------	------

Figure 3.25 UDP Setup

3.3.9. TCP Server Application: Enable Virtual COM

SE5001A will encapsulate control packets on top of the real data when Virtual COM is enabled. This will allow the Virtual COM port in the Windows/Linux system to access SE5001A's COM ports. The benefit of using Virtual COM is that rewriting an existing COM program to read IP packets is unnecessary. In other words, it is possible to use an ordinary serial (COM) program. The conversion/virtualization of IP to COM is all done in the system driver transparently. Figure 3.26 shows SE5001A in TCP Server mode with Virtual COM enabled.

LINK1
To choose specific working mode for COM port.

☒ TCP Server ☐ TCP Client ☐ UDP

Enable VirtualCOM for Serial/IP	<input checked="" type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Enable VirtualCOM Authentication (Note: An empty password will fail to authenticate)	<input type="checkbox"/> Enable
Local Listening Port	4660
IP Filter	<input type="checkbox"/> Enable, Source IP : 0.0.0.0
Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)

Figure 3.26 TCP Server with Virtual COM Enabled

- ➔ Follow section [3.2.5](#) to configure SE5001A in TCP Server mode properly.
- ➔ Check **Enable VirtualCOM for Serial/IP** to enable Virtual COM application in SE5001A.
- ➔ Check **Enable VirtualCOM Authentication (Note: An empty password will fail to authenticate)** to lock up Virtual COM access with SE5001A's login password.
- ➔ Scroll to the bottom of the page and click on **"Save Configuration"** button to save the changes.
- ➔ Configure Virtual COM in the Operating System. For Windows, refer to [Using Virtual COM](#). Remember SE5001A's IP address and the **Local Listening Port** here in order to enter this information in Serial/IP Virtual COM's Control Panel later.

3.3.10. TCP Server Application: Enable RFC 2217

The underlying protocol of Virtual COM is based on RFC 2217, the Telnet COM Control Option. Therefore, it is possible to use RFC 2217 with SE5001A in the TCP Server mode. To do so, refer to section 3.3.9 to enable Virtual COM, so that SE5001A becomes aware of the commands. Note that there is no need to configure Virtual COM on the Operating System because Virtual COM ports would not be used.

3.3.11. TCP Client Application: Enable Virtual COM

It is also possible to run Virtual COM in TCP Client mode (Figure 3.27). It is usually easier to use Virtual COM in the Client mode if SE5001A uses dynamic IP (DHCP) because setting a static IP address in Virtual COM's Control Panel is not possible.

LINK1
To choose specific working mode for COM port.

☐ TCP Server ☒ TCP Client ☐ UDP

Enable VirtualCOM for Serial/IP	<input checked="" type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable

Destination IP, Destination Port	IP : 10.0.160.88	Port : 4660
Connecting Rule of TCP Client	<input checked="" type="radio"/> TCP Connect On Power-on <input type="radio"/> TCP Connect On Any Serial Character	

Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)

Figure 3.27 TCP Client with Virtual COM Enabled

- ➔ Follow section 3.2.6 to configure SE5001A in TCP Client mode properly.
- ➔ Check **Enable VirtualCOM for Serial/IP** to enable Virtual COM application in SE5001A.
- ➔ Scroll to the bottom of the page and click on “**Save Configuration**” button to save the changes.
- ➔ Configure Virtual COM in the Operating System. For Windows, refer to [Using Virtual COM](#). Remember SE5001A's IP address and the **Local Listening Port** here in order to enter this information in Serial/IP Virtual COM's Control Panel later.

3.3.12. TCP Client Application: Enable RFC 2217

The underlying protocol of Virtual COM is based on RFC 2217, the Telnet COM Control Option. Therefore, it is possible to use RFC 2217 with SE5001A in the TCP Client mode. To do so, refer to section 3.3.11 to enable Virtual COM, so that SE5001A becomes aware of the commands. Note that there is no need to configure Virtual COM on the Operating System because Virtual COM ports would not be used.

3.3.13. TCP Server Application: Configure SE5001A as a Pair Connection Master

Pair Connection is useful when pairing up two serial devices over the Ethernet or when it is impossible to install Virtual COM in the serial device. Pair connection does require two SE5001As to work in pair, one would be the Pair Connection Master (0) and the other would be the Pair Connection Slave.

The screenshot shows the 'LINK1' configuration page for the SE5001A Serial Device Server. The page title is 'LINK1' and the subtitle is 'To choose specific working mode for COM port.' Below the subtitle, there are three radio buttons for selecting the working mode: 'TCP Server' (selected), 'TCP Client', and 'UDP'. Below the radio buttons, there are two rows of configuration options, each with a label and a checkbox: 'Enable VirtualCOM for Serial/IP' (checkbox is unchecked) and 'Pair Connection' (checkbox is checked). Below these options, there are four rows of configuration options, each with a label and a text input field: 'Local Listening Port' (input is 4660), 'IP Filter' (checkbox is unchecked, followed by 'Source IP : 0.0.0.0'), 'Idle Time Before Sending TCP Alive Packet' (input is 4, followed by '*10 sec (0~255, 0:Disable)'), and 'TCP Inactivity Time Before Disconnect' (input is 0, followed by 'sec (0~255, 0:Disable)').

Figure 3.28 TCP Server with Pair Connection Enabled

- Follow section 3.2.5 to configure SE5001A in TCP Server mode properly.
- Check **Enable Pair Connection** to enable Pair Connection application in SE5001A.
- Scroll to the bottom of the page and click on **"Save Configuration"** button to save the changes.
- Go to the Pair Connection Slave Setup below (section 3.3.14). Remember SE5001A's IP address and the **Local Listening Port** here in order to enter this information in the Pair Connection Slave later.

3.3.14. TCP Client Application: Configure SE5001A as a Pair Connection Slave

A Pair Connection Slave (Figure 3.29) needs to pair up with a Pair Connection Master. Please setup a Pair Connection Master first before proceeding.

LINK1

To choose specific working mode for COM port.

☐ TCP Server
 ☒ TCP Client
 ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input checked="" type="checkbox"/> Enable

Destination IP, Destination Port	IP : <input type="text" value="10.0.160.88"/> Port : <input type="text" value="4660"/>
Connecting Rule of TCP Client	<input checked="" type="radio"/> TCP Connect On Power-on <input type="radio"/> TCP Connect On Any Serial Character

Idle Time Before Sending TCP Alive Packet	<input type="text" value="4"/> *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	<input type="text" value="0"/> sec (0~255, 0:Disable)

Figure 3.29 TCP Client with Pair Connection Enabled

- ➔ Follow section 3.2.6 to configure SE5001A in TCP Client mode properly.
- ➔ Check **Enable Pair Connection** to enabled Pair Connection application in SE5001A.
- ➔ Scroll to the bottom of the page and click on “**Save Configuration**” button to save the changes.
- ➔ Match the **Destination IP and Port** here with the settings of Pair Connection Master's IP and **Listening Port** setup previously.

3.3.15. TCP Server Application: Enable Reverse Telnet

Reverse Telnet application is useful if a telnet program is used to connect to SE5001A and the serial interface of the SE5001A is connected to a Terminal Server. Telnet programs in Windows / Linux usually require special handshaking to get the outputs and formatting show properly. SE5001A will interact with those special commands (CR/LF commands) if Reverse Telnet is enabled.

LINK1
To choose specific working mode for COM port.

☒ TCP Server
 ☐ TCP Client
 ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Reverse Telnet Mode	<input checked="" type="checkbox"/> Enable

Local Listening Port	4660
IP Filter	<input type="checkbox"/> Enable, Source IP : 0.0.0.0
Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)

Figure 3.30 TCP Server with Reverse Telnet Enabled

- ➔ Follow section 3.2.5 to configure SE5001A in TCP Server mode properly.
- ➔ Check **Enable Pair Connection** to enabled Pair Connection application in SE5001A.
- ➔ Scroll to the bottom of the page and click on **"Save Configuration"** button to save the changes.

3.3.16. UDP Application: Multi-Point Pair Connection

It is also possible to setup pair connection in UDP mode to have more than one Pair Connection Master or Slave to communicate to each other. For example, it is possible to setup one Modbus Master and six Modbus Slaves in UDP (Figure 3.31). Note again that UDP does not guarantee data delivery and **only data would be transmitted over Ethernet; other serial pings are not transmitted**. If RS-232 along with flow control, it is recommended to use Multi-Point Pair Connection in TCP (section 3.3.18).

- ➔ Note that the Destination IP and Port of the Slaves need to be equal to the Master's IP and Port. Local Listening Port of the Slaves needs to be equal to the Master's Destination Port.

Sample Configuration:

	IP Address	Link Mode	Local Listening Port	Destination IP	Destination Port
SE5001A Master	10.0.50.100	UDP	5000	10.0.50.200~10.0.50.207	5000
SE5001A Slave 1	10.0.50.200	UDP	5000	10.0.50.100	5000
SE5001A Slave 2	10.0.50.201	UDP	5000	10.0.50.100	5000
SE5001A Slave 3	10.0.50.202	UDP	5000	10.0.50.100	5000
SE5001A Slave 4	10.0.50.203	UDP	5000	10.0.50.100	5000
SE5001A Slave 5	10.0.50.204	UDP	5000	10.0.50.100	5000
SE5001A Slave 6	10.0.50.205	UDP	5000	10.0.50.100	5000

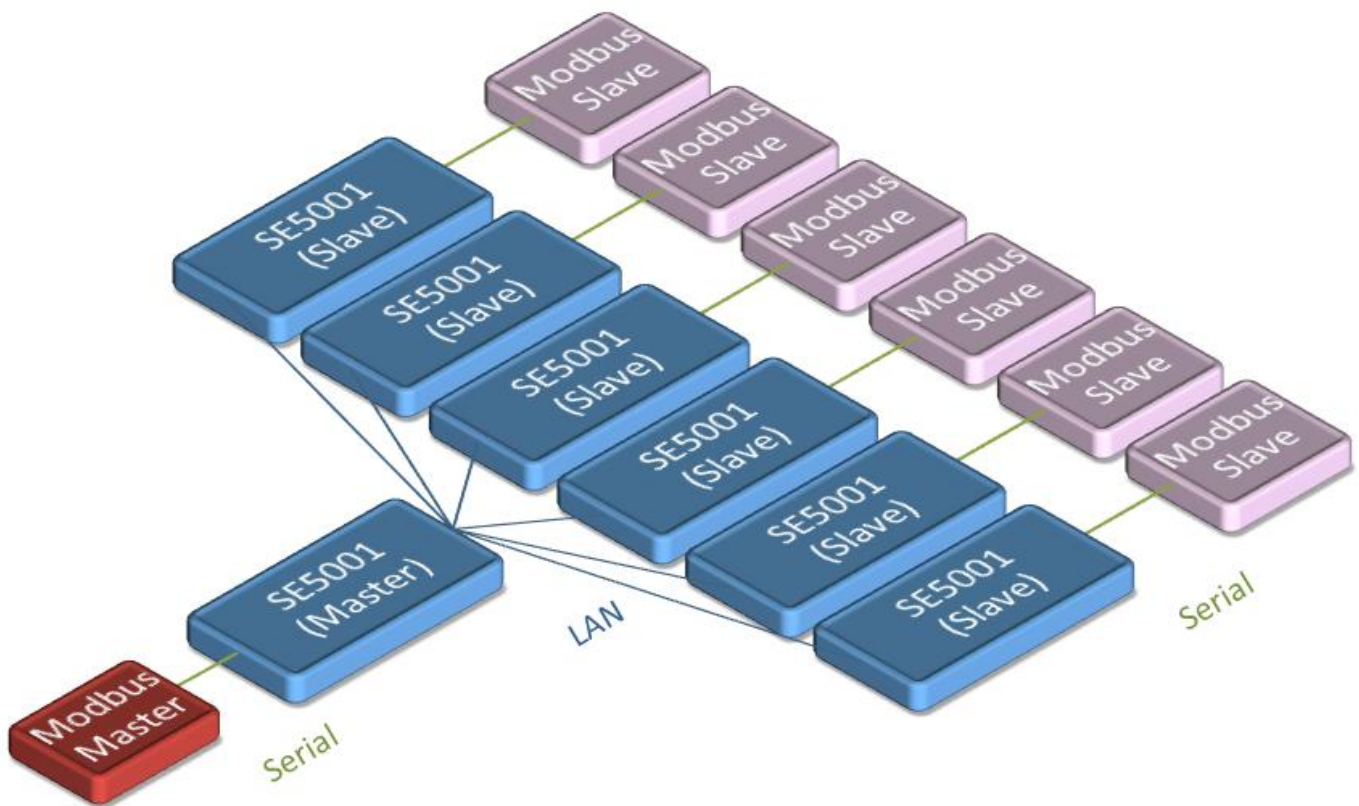


Figure 3.31 Multi-Point UDP Pair Connection with Modbus

3.3.17. TCP Server Application: Multiple TCP Connections

To have more than one TCP Client connecting to SE5001A in TCP Server mode, contact Atop Technical Support to obtain a special multi-connection version firmware. After the firmware is uploaded to SE5001A, the WebUI will have one additional option called “**Multiple_Connections**” (Figure 3.32). The Multi-Connection option will allow up to a maximum of four TCP Client connections. SE5001A will broadcast serial data to all connected TCP Clients. Note that it is also possible to use this multi-connection feature in conjunction with other TCP Server applications, such as Virtual COM, Pair Connection, and Reverse Telnet. For example, enabling multi-connection along with Pair connection will result in Multi-Point Pair Connection in TCP mode (section 3.3.18).

LINK1

To choose specific working mode for COM port.

☒ TCP Server
 ☐ TCP Client
 ☐ UDP

Enable VirtualCOM for Serial/IP	<input type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Reverse Telnet Mode	<input type="checkbox"/> Enable

Local Listening Port	4660
IP Filter	<input type="checkbox"/> Enable, Source IP : 0.0.0.0
Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)
Multiple_Connections	<input checked="" type="checkbox"/> Enable (Max. 4 Connections)

Figure 3.32 TCP Server with Multiple Connections Enabled

3.3.18. TCP Server Application: Multi-Point TCP Pair Connections

The difference between Multi-Point TCP Pair Connection and Multi-Point UDP Pair Connection is that the TCP implementation would also exchange flow controls pins of RS-232. However, the TCP Server is limited to a maximum of four connections. If there are than four serial devices and does not use flow control pins with RS-232 or RS-485, it is possible to setup pair connection in UDP mode (section 3.3.16). After multi-connection is enabled in the WebUI, refer to the following table to setup Pair Connection as in Figure 3.33.

	IP Address	Link Mode	Local Listening Port	Destination IP	Destination Port
SE5001A Master	10.0.50.100	TCP Server	5000	-	5000
SE5001A Slave 1	10.0.50.200	TCP Client	5000	10.0.50.100	5000
SE5001A Slave 2	10.0.50.201	TCP Client	5000	10.0.50.100	5000
SE5001A Slave 3	10.0.50.202	TCP Client	5000	10.0.50.100	5000
SE5001A Slave 4	10.0.50.203	TCP Client	5000	10.0.50.100	5000

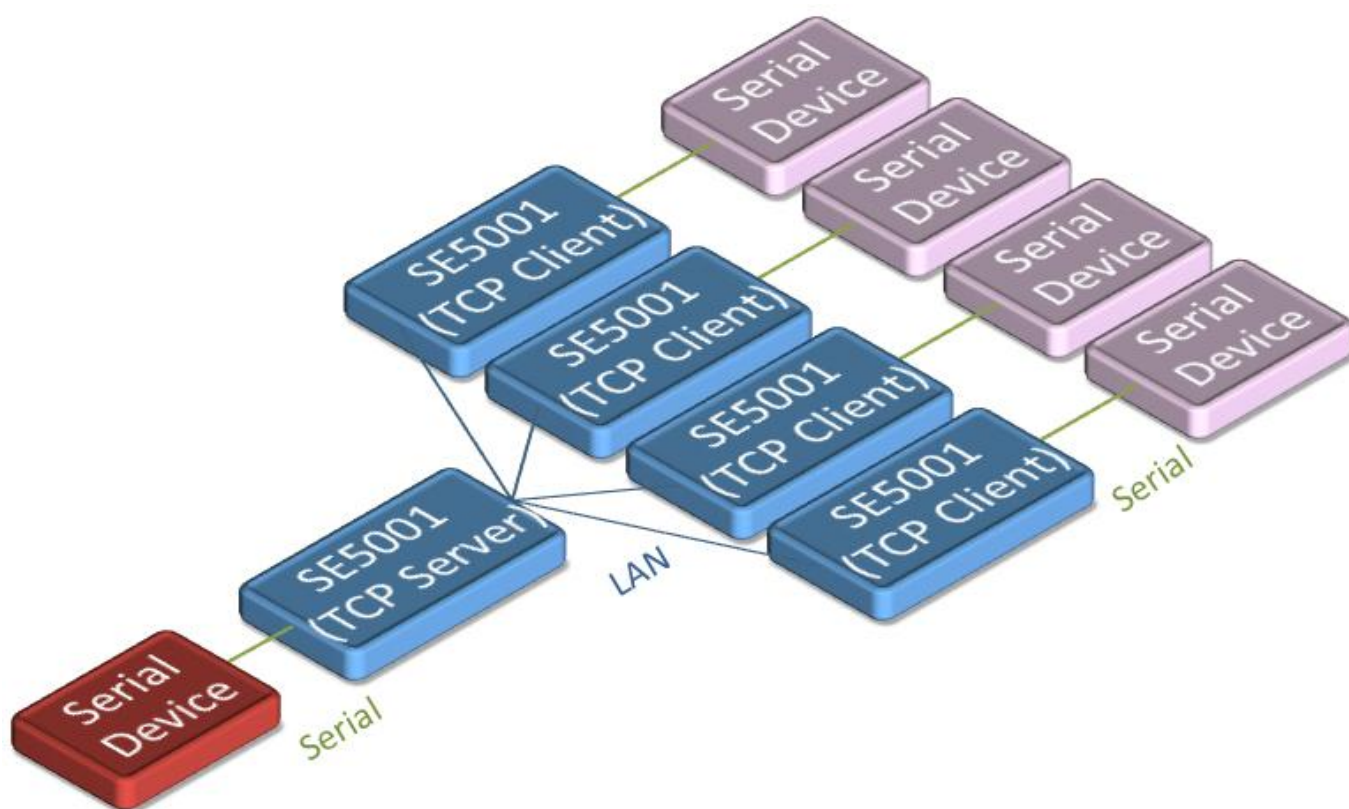


Figure 3.33 Multi-Point TCP Pair Connection

3.3.19. COM Configuration

Configure serial settings in this page (Figure 3.34). Note that these settings need to match the ones in the serial device.

Alias Name:

This field is for identification purpose only.

Baud Rate:

Select one of the baud rates from the dropdown box, or select **Other** and then enter the desired baud rate in the input box. Baud rates higher than 230400bps are not supported.

Parity / Data Bits / Stop Bits:

Configure them accordingly.

Flow Control:

Choose between No Flow Control, RTS/CTS (Hardware Flow Control), DTR/DSR, Xon/Xoff (Software Flow Control). If Xon/Xoff is selected, Xon and Xoff characters are changeable. Defaults are 0x11 for Xon and 0x13 for Xoff. If the serial device uses Xon/Xoff in conjunction with DTR/DSR, enable **Controlling DTR to simulate receiving Xon/Xoff and reading DSR to get Xon/Xoff currently**.

Empty Serial Buffer When TCP Connection is Established:

By default, SE5001A will empty its serial buffer when a new TCP connection is established. This means that the TCP application will not receive buffered serial data during a TCP link breakage. To keep the serial data when there is no TCP connection and send out the buffered serial data immediately after a TCP connection is established, set this option to **No**.

Data Packet Delimiter:

Packet delimiter is a way of packing data in the serial communication. It is designed to keep packets in track. SE5001A provides two types of delimiter: **Time Delimiter**, and **Character Delimiter**. When the selected delimiter condition is met, SE5001A would transmit the serial data in its buffer over the network.

- ➔ Time Delimiter: SE5001A will transmit the serial data in its buffer when the specified time interval has reached and no more serial data comes in. The default time is 2ms, which means SE5001A will push out its serial buffer if it does not receive any serial data within 2ms. This delimiter is selected by default.
- ➔ Character Delimiter: will transmit the serial data in its buffer when it sees the incoming data include the specified character (in HEX format). This field allows one or two characters. If character delimiter is set to 0x0d, SE5001A will push out its serial buffer when it sees 0x0d (carriage return) in the serial data.

COM Type Selection:

Select between RS-232, RS-422, and RS-485. Note that RS-485 refers to 2-Wire RS-485 and RS-422 is compatible with 4-Wire RS-485.

Click on “**Save Configuration**” button to save the changes.

COM1

To configure COM port parameters.

Serial Interface	RS-232
Alias Name	<input type="text"/>
Baud Rate	9600 <input type="button" value="v"/>
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even <input type="radio"/> Mark <input type="radio"/> Space
Data Bits	<input type="radio"/> 7 bits <input checked="" type="radio"/> 8 bits
Stop Bits	<input checked="" type="radio"/> 1 bit <input type="radio"/> 2 bits
Flow Control	<input type="radio"/> None <input type="radio"/> RTS/CTS <input type="radio"/> DTR/DSR <input checked="" type="radio"/> Xon/Xoff
Xon/Xoff characters	Xon: <input type="text" value="0x11"/> Xoff: <input type="text" value="0x13"/> ("0x"+ASCII Code, e.g. 0x11)
Xon/Xoff Special Control	<input type="checkbox"/> Controlling DTR to simulate receiving Xon/Xoff and reading DSR to get Xon/Xoff currently
Empty Serial Buffer When TCP Connection is Established	<input checked="" type="radio"/> YES <input type="radio"/> No, (Default: Yes)
Data Packet Delimiter	<input checked="" type="radio"/> Inter-character Time Gap : <input type="text" value="2"/> msec (0~30000, 0:Disable) <input type="radio"/> Characters : <input type="text" value="0x0d"/> ("0x" + Hex Code, e.g. "0x0d" or "0x0d0a")
COM Type Selection	<input checked="" type="radio"/> RS232 <input type="radio"/> RS485 <input type="radio"/> RS422

Figure 3.34 COM Configuration

4 Using Virtual COM

Virtual COM allows remote access of serial devices over TCP/IP networks through Serial/IP Virtual COM ports that work like local native COM ports. The following figure is a Virtual COM connection diagram. (Figure 4.1)

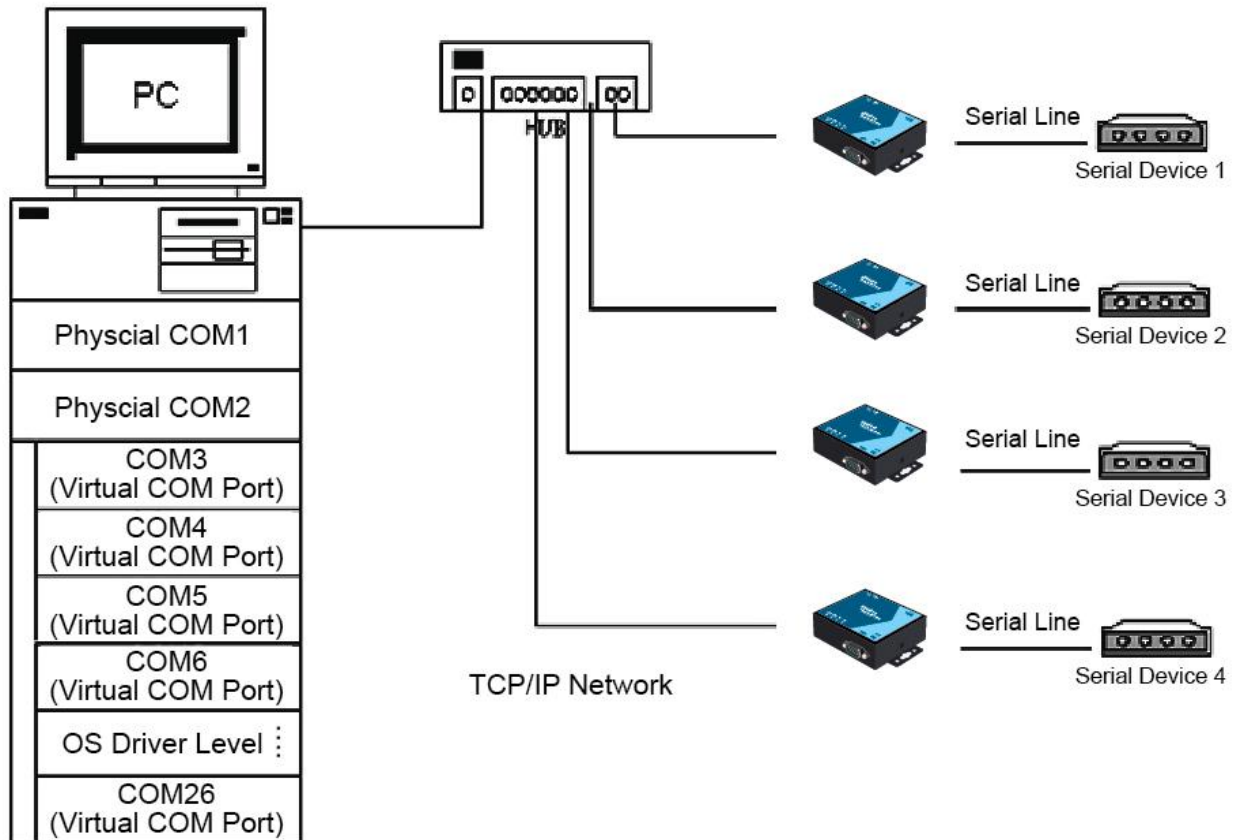


Figure 4.1 Virtual Com connection diagram

4.1 Setup of a Virtual COM Driver

4.1.1 System Requirements

Windows 7, 2008, Vista, 2003, XP, 2000, NT 4.0, 9x, Microsoft NT/2000/2003 Terminal Server, Citrix MetaFrame Access Suite, native and virtual, 32 and 64-bit versions. Note that upgrading the operating systems to the latest Service Packs is required, especially for older Windows versions.

To run Virtual COM in Linux, there is a separate package called TTYredirector available for download on Atop website or in the product CD. The zipped package includes a binary file for installation and a manual for Linux systems.

4.1.2 Limitation

The Virtual COM driver allows up to 256 **Virtual COM ports** in a single PC. Selecting in the range from COM1 to COM4096 is allowed. Note that COM ports already occupied by the system or other devices will not be available.

4.1.3 Installation

Run the Virtual COM setup file included in the CD or download a copy from our website to install the Virtual COM driver for the operating system. Turn off anti-virus software and try again if installation fails. At the end of the installation, please select at least one Virtual COM port from the Serial/IP Control Panel.

4.1.4 Uninstalling

- From Windows Start Menu select Control Panel, Add/Remove Programs.
- Select **Serial/IP Version x.x.x** in the list of installed software.
- Click the **Remove** button to remove the program.

4.2 Enable Virtual COM Serial device servers and Select Virtual COM in Windows

4.2.1 Enable Virtual COM in Serial Device Servers

Enable Virtual COM in our serial device servers by logging into our WebUI. It is located under COM configuration. Following figures show how to enable Virtual COM in different serial device servers that we offer. For detailed Link Mode configuration with Virtual COM, please refer to the previous sections starting from section 3.3.9 on Link Mode configurations.

LINK1
To choose specific working mode for COM port.

☒ TCP Server
 ☐ TCP Client
 ☐ UDP

Enable VirtualCOM for Serial/IP	<input checked="" type="checkbox"/> Enable
Pair Connection	<input type="checkbox"/> Enable
Enable VirtualCOM Authentication (Note: An empty password will fail to authenticate)	<input type="checkbox"/> Enable
Local Listening Port	4660
IP Filter	<input type="checkbox"/> Enable, Source IP : 0.0.0.0
Idle Time Before Sending TCP Alive Packet	4 *10 sec (0~255, 0:Disable)
TCP Inactivity Time Before Disconnect	0 sec (0~255, 0:Disable)

Figure 4.2 Enable Virtual COM in SE5001A

It is also possible to enable Virtual COM in serial device servers using Telnet. Please refer to the section 3.2.8 on Telnet.

4.2.2 Running Serial/IP in Windows

Find Serial/IP Control Panel from:

- Start->All Programs-> Serial/IP->Control Panel
- In the Windows Control Panel, open the Serial/IP applet.
- In the Windows notification area (Figure 4.5), right click in the Serial/IP tray icon and click on **Configure** to open the Control Panel.



Figure 4.5 Serial/IP Notification Tray Icon

If no Virtual COM port is selected, a dialog will pop up and asks to select at least one port as the Virtual COM port before proceeding (Figure 4.6).

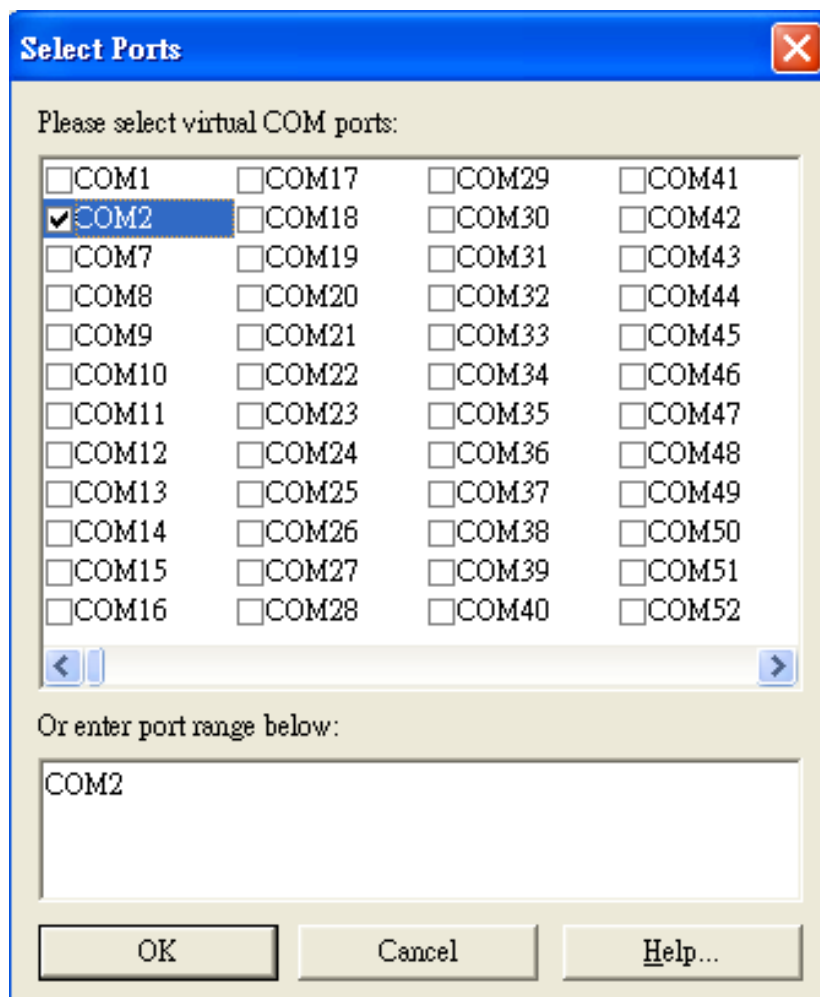


Figure 4.6 Select Virtual COM Ports

After at least one Virtual COM port is selected, the Control Panel will show (Figure 4.7).

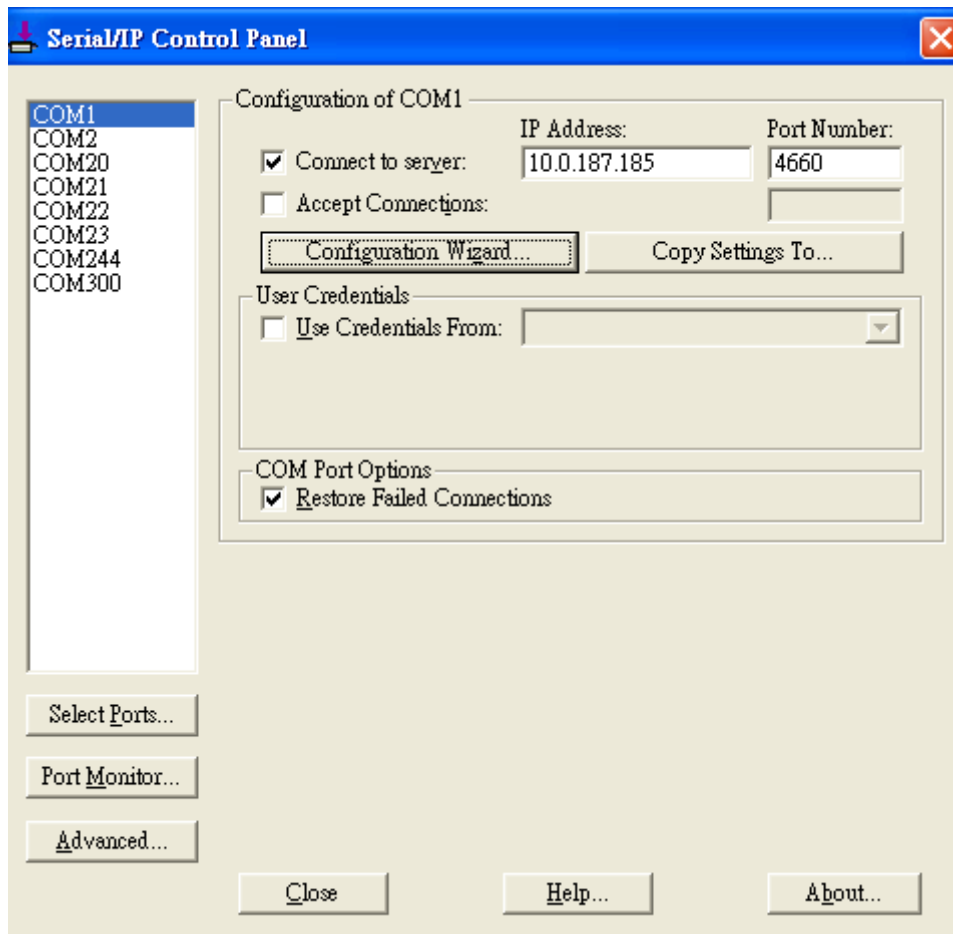


Figure 4.7 Serial/IP Control Panel

The left hand side of the Control Panel shows the list of selected Virtual COM ports. Click on **Select Ports** to add or remove Virtual COM ports from the list. The right hand side of the Control Panel shows the configurations of the selected Virtual COM port marked in blue. Each Virtual COM port can have its own settings.

Note: The changes to Virtual COM ports apply immediately, so there is no need to save the settings manually. However, if the Virtual COM port is already in use, it is necessary to close the Virtual COM port and open it after the TCP connection closes completely in order for the changes to take effect.

4.3 Configuring Virtual COM Ports

To Configure Virtual COM ports (Figure 4.7):

- i. If the serial device server is running in TCP Server mode (recommended), Serial/IP should be the TCP Client connecting to the serial device server. Enable **Connect to Server** and enter the **IP Address** of the serial device server with the **Port Number** specified. The **Port Number** here is the Local Listening Port of the serial device server.
- ii. If the serial device server is running in TCP Client mode, Serial/IP should be the TCP Server waiting for SE5001A to connect it. Enable **Accept Connections** and enter the **Port Number**. The **Port Number** here is the Destination Port of the serial device server. Do not enable **Connect to Server** and **Accept Connections** together.
- iii. If **Enable VirtualCOM Authentication** is enabled in the serial device server (this is only

available in limited serial device servers), it is necessary to enable **Use Credentials From** and select **Use Credentials Below** from the list (Figure 4.8). Enter the **Username** and **Password** of the serial device server in the respective fields.

iv.

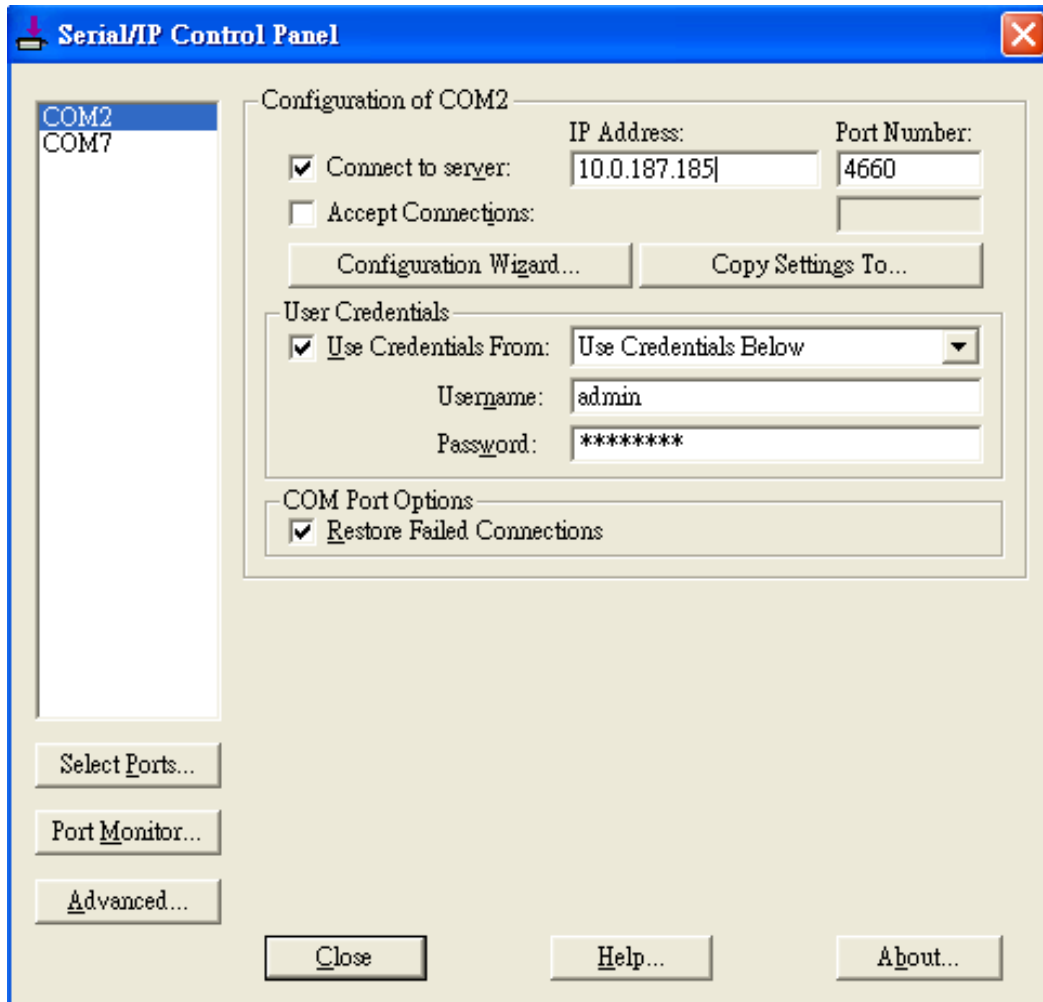


Figure 4.8 Virtual COM with Credentials

- v. Enable **Restore Failed Connections** to force Virtual COM to automatically restore failed connections with the serial device server in the case of unstable network connections.
- vi. To test the Virtual COM connection, click the Configuration Wizard button and then click **Start** button in the pop up window (Figure 4.9). If the test passes, all checks should be in green. To apply the changes in the Configuration Wizard window to the Control Panel, click on **Use Settings**. Click on **Copy** to copy the results to the system clipboard.
- vii. To transfer the settings between Virtual COM ports, click on the **Copy Settings To** button.

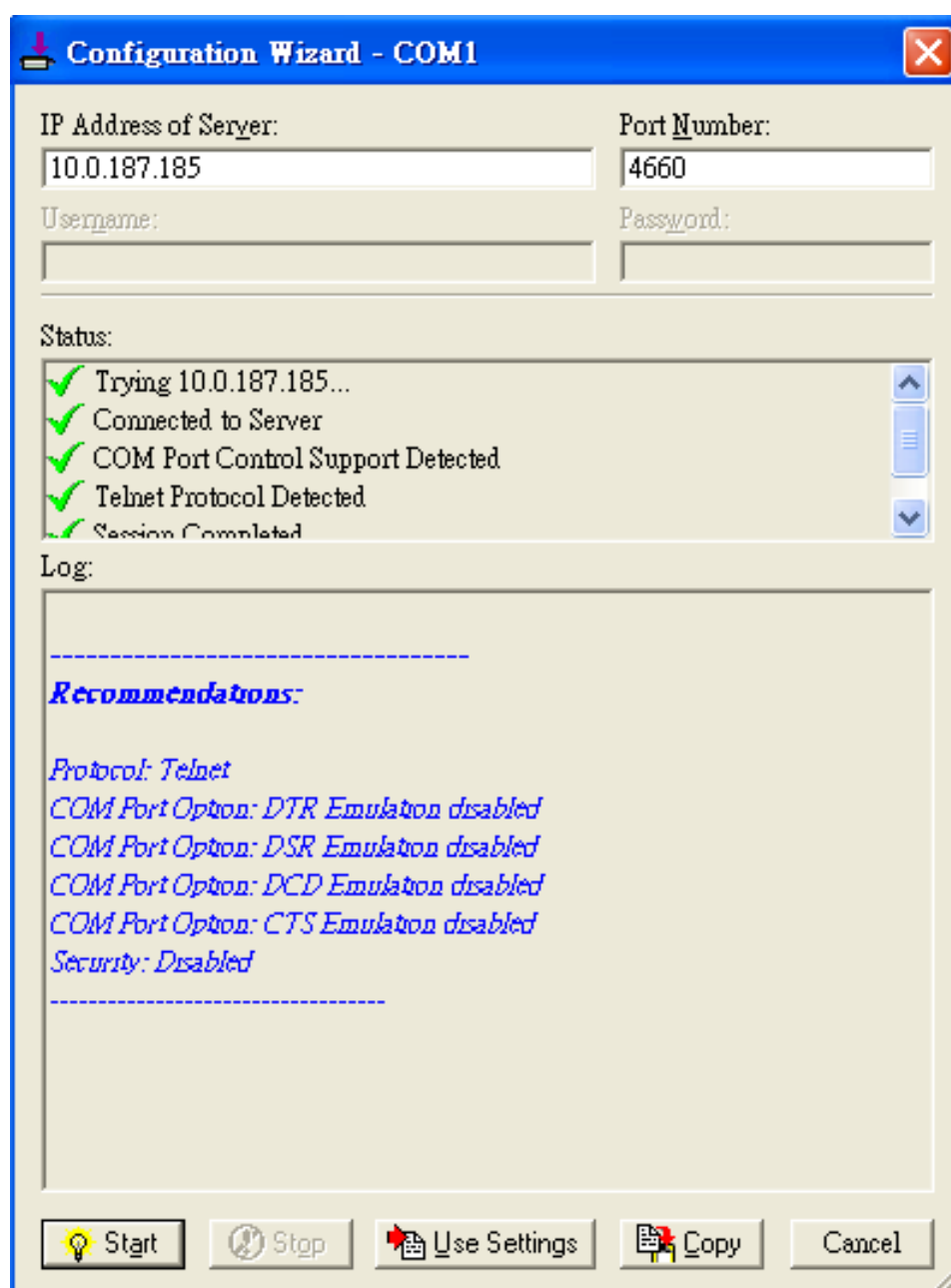


Figure 4.9 Configuration Wizard

Exceptions:

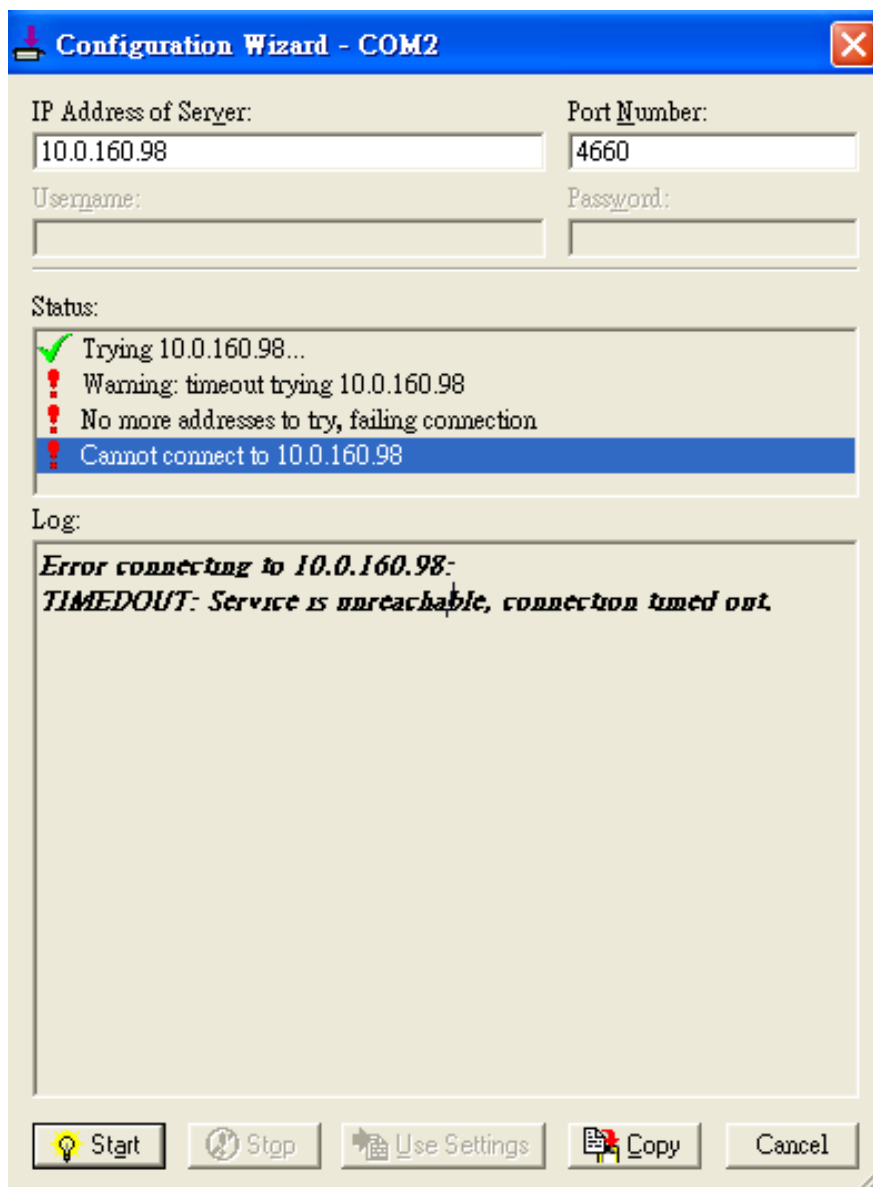


Figure 4.10 Virtual COM Timeout Exception

- a. If the exclamation mark begins with **Warning: timeout trying x.x.x.x** (Figure 4.10), recheck the Virtual COM IP and Port configuration or the PC's network configuration.

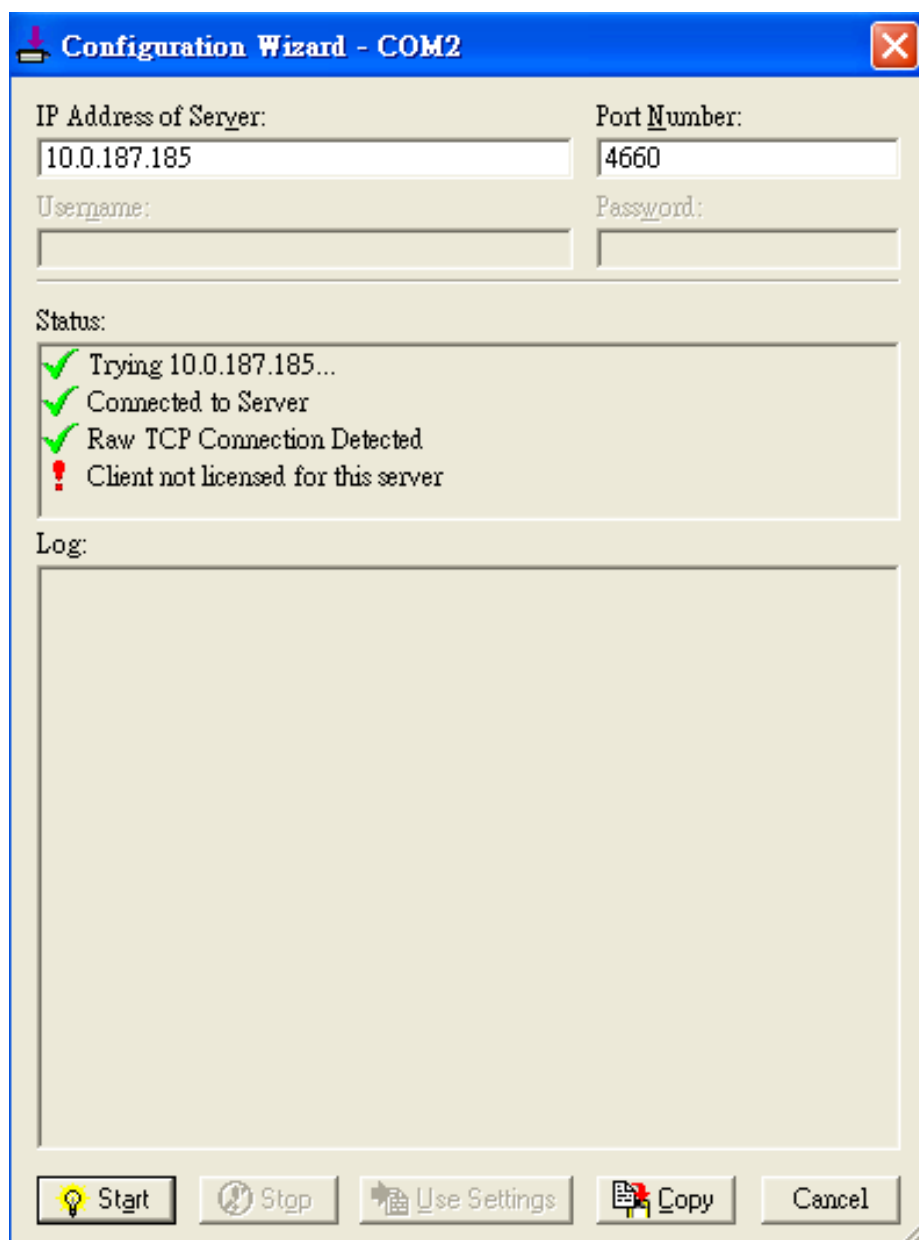


Figure 4.11 Virtual COM Raw Connection Exception

- b. If there is a check with **Raw Connection Detected** and an exclamation mark with **Client not licensed for this server** (Figure 4.11), enable Virtual COM in the serial device server.

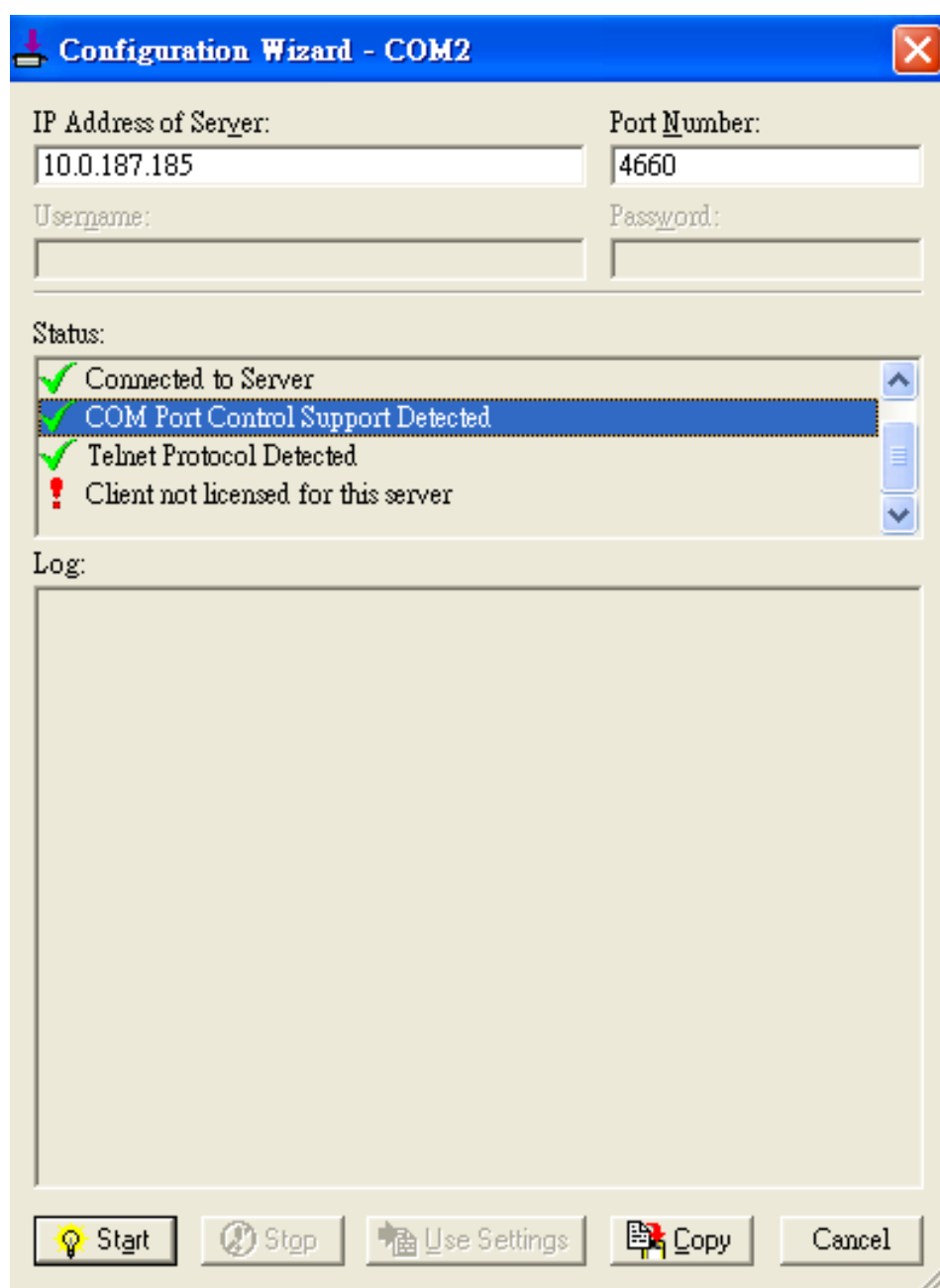


Figure 4.12 Virtual COM License Exception

- c. If there is a check with **Telnet Protocol Detected** and an exclamation mark with **Client not licensed for this server** (Figure 4.12), this means that there is a licensing issue between the serial device server and Serial/IP. Please contact Atop technical support to obtain the correct Virtual COM software.

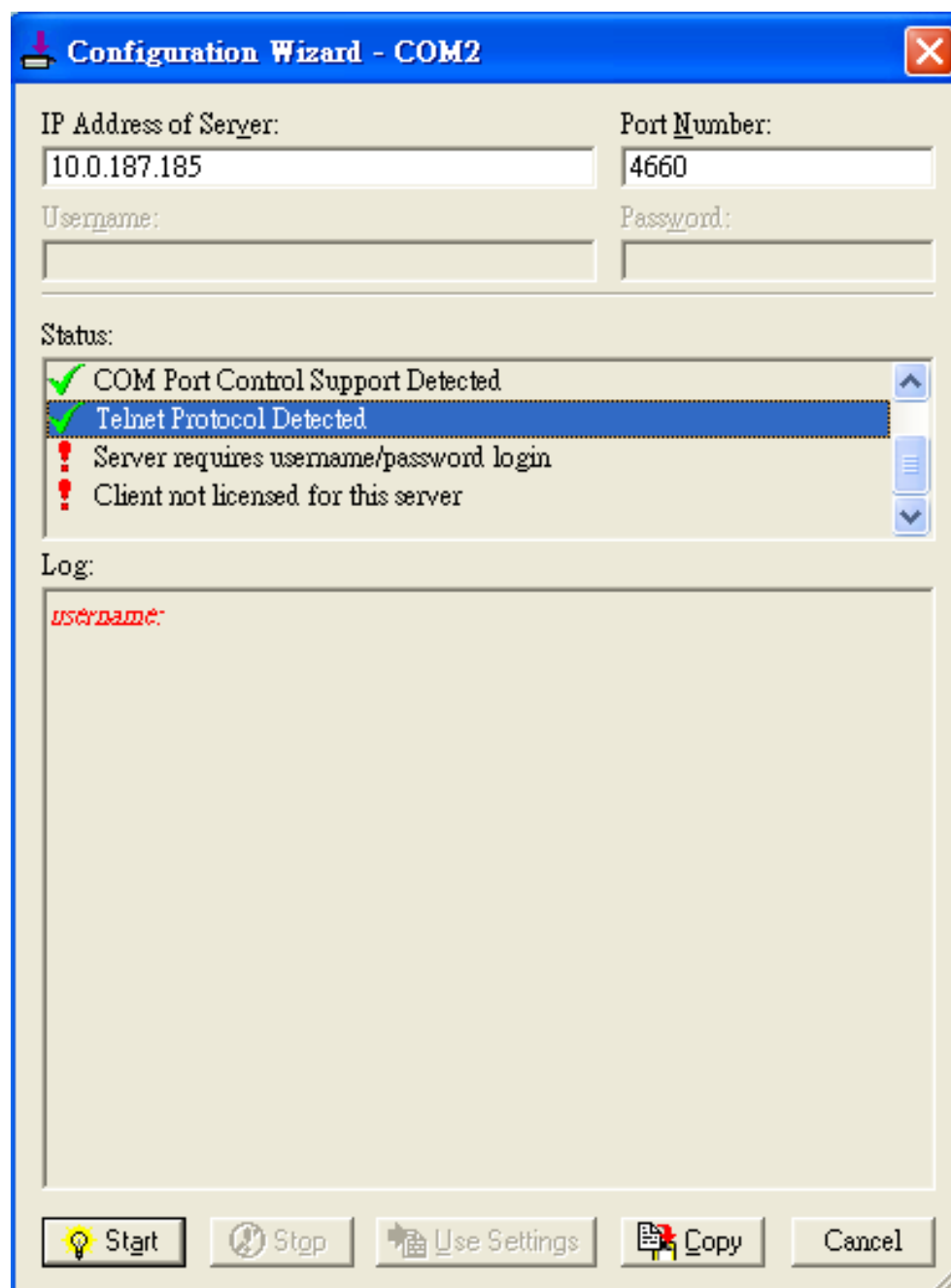


Figure 4.13 Virtual COM Credentials Exception

- d. If the exclamation mark begins with **Server requires username/password login** (Figure 4.13), it means VirtualCOM Authentication in the serial device server is enabled, but credentials in the Serial/IP is not enabled.

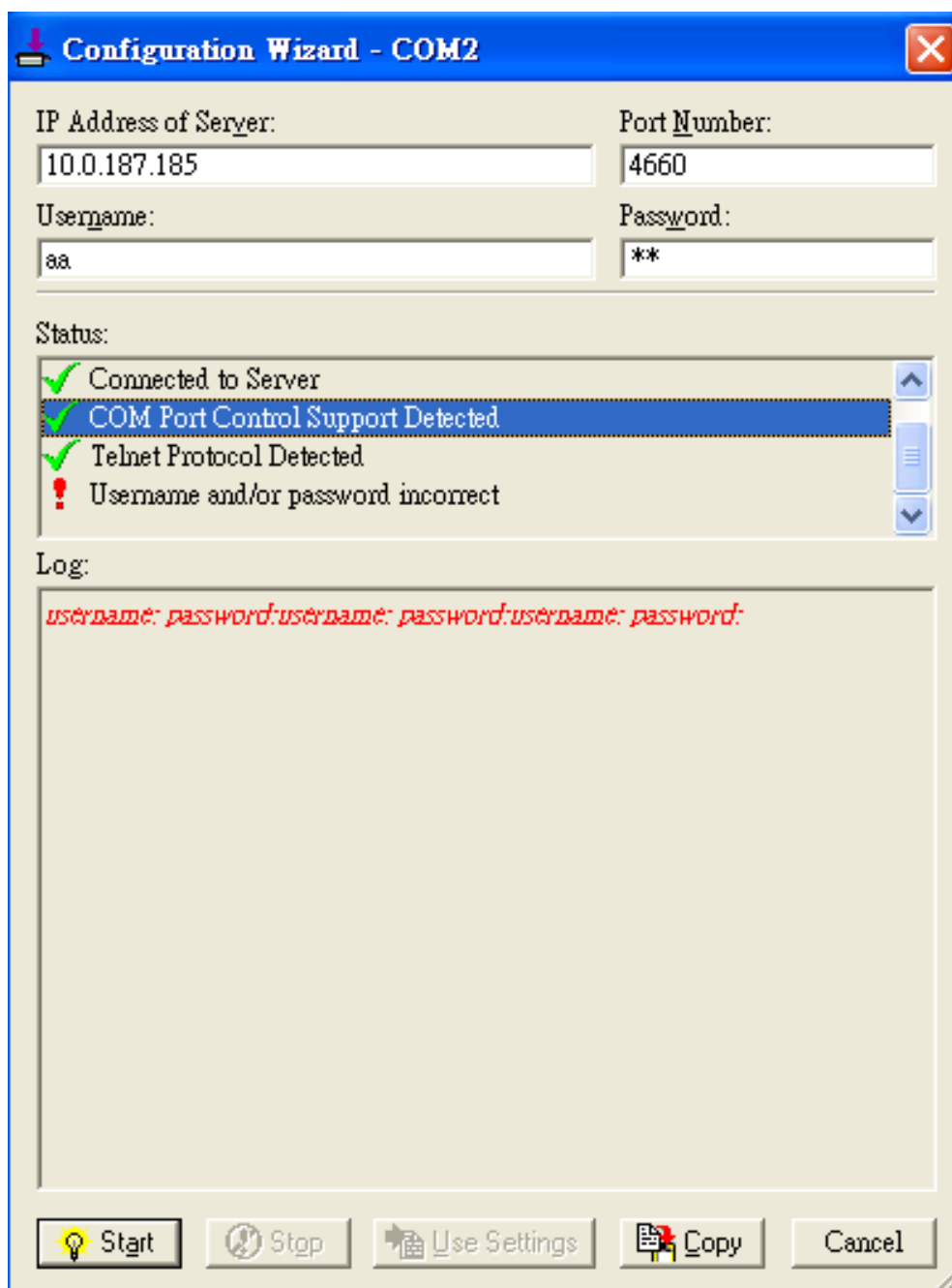


Figure 4.14 Virtual COM Username Password Exception

- e. If the exclamation mark begins with **Username and/or password incorrect** (Figure 4.14), this means the wrong username and/or password was entered and the authentication failed.

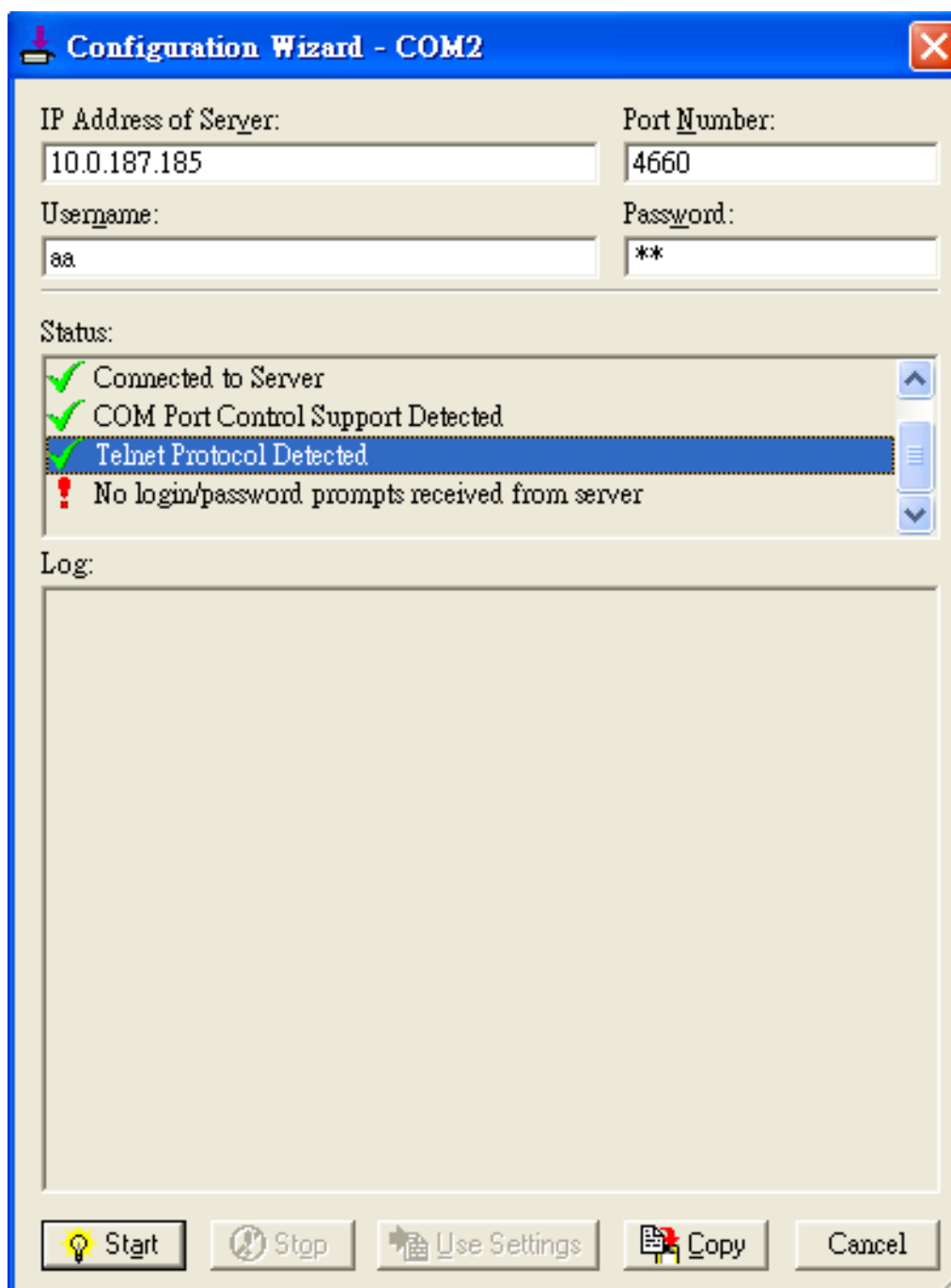


Figure 4.15 Virtual COM Credentials Exception

- f. If the exclamation mark begins with **No login/password prompts received from server** (Figure 4.15), it means credentials in the Serial/IP is enabled, but VirtualCOM Authentication in the serial device server is not enabled.

4.4 Using Serial/IP Port Monitor

4.4.1. Opening the Port Monitor

The Serial/IP Port Monitor can be opened by:

- Start->All Programs-> Serial/IP->Port Monitor
- Double click the Serial/IP tray icon in the Windows notification area (Figure 4.5).
- In the Windows notification area (Figure 4.5), right click in the Serial/IP tray icon and click on **Port Monitor** to open the Port Monitor.
- Click on the **Port Monitor** button in the Serial/IP Control Panel

4.4.2. The Activity Panel

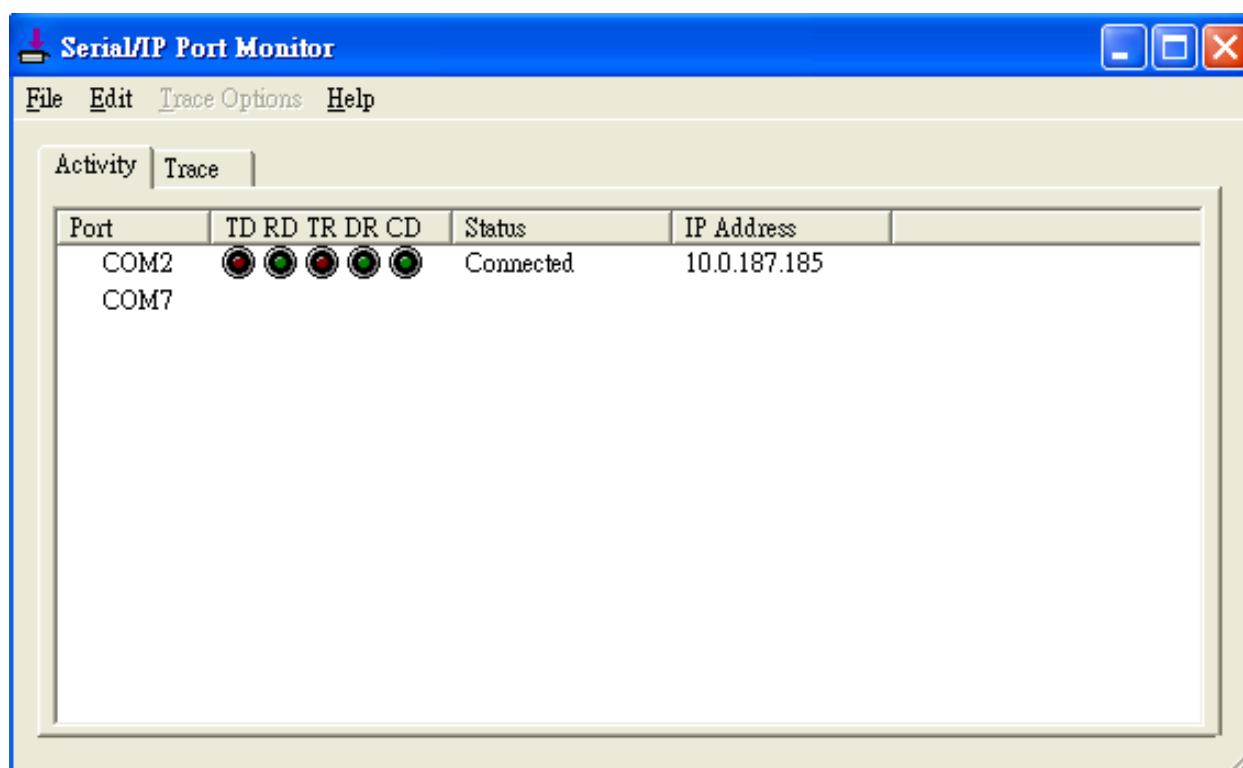


Figure 4.16 Port Monitor Activity Panel

The Activity panel provides a real-time display of the status of all Serial/IP COM ports (Figure 4.16). If the Virtual COM Port is open and is properly configured to connect to a serial device server, the status would be **Connected**. If Serial/IP cannot find the specified serial device server, the status would be **Offline**.

4.4.3. The Trace Panel

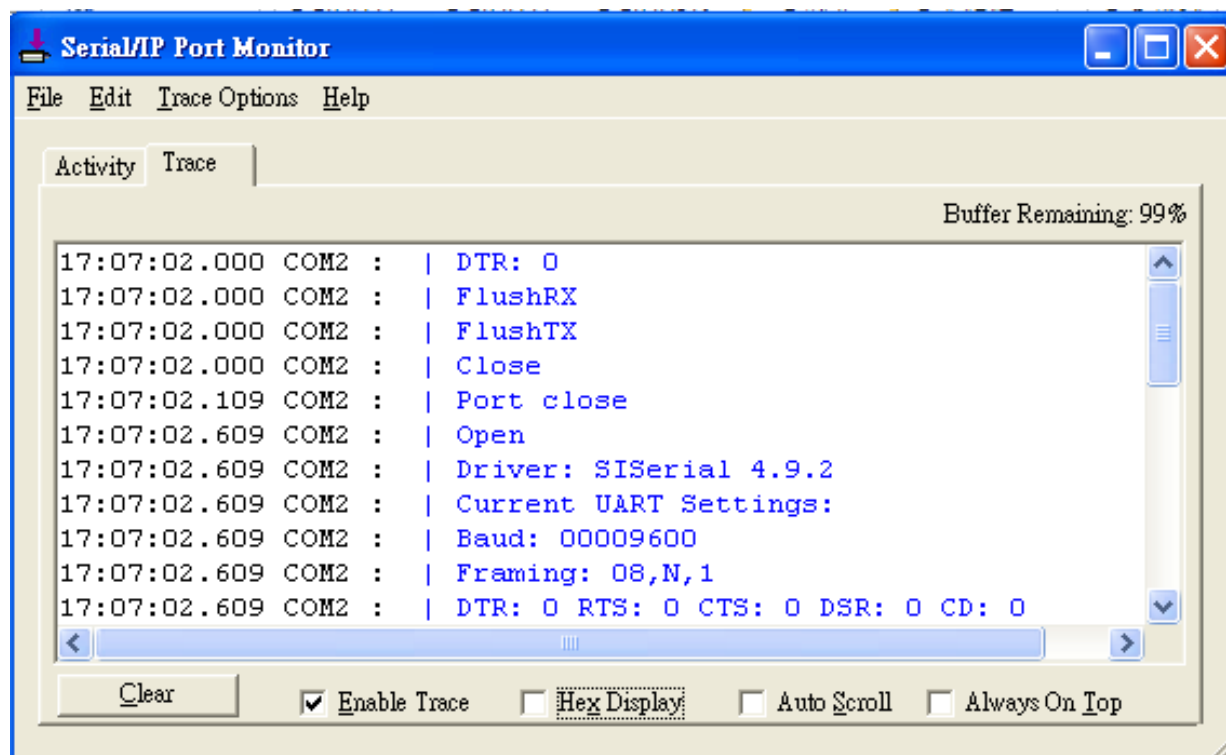


Figure 4.17 Port Monitor Trace Panel

The Trace panel provides a detailed, time-stamped, real-time display of all Serial/IP COM ports operations (Figure 4.17). Click on **Enable Trace** to start logging Virtual COM communication. Click on File->Save As and send the log to Atop for analysis If problems arises with Virtual COM.

4.5 Serial/IP Advanced Settings

In the Serial/IP Control Panel, Click on the **Advanced** button to open Advanced Settings window (Figure 4.18). Click on **Use Default Settings** to load the default settings.

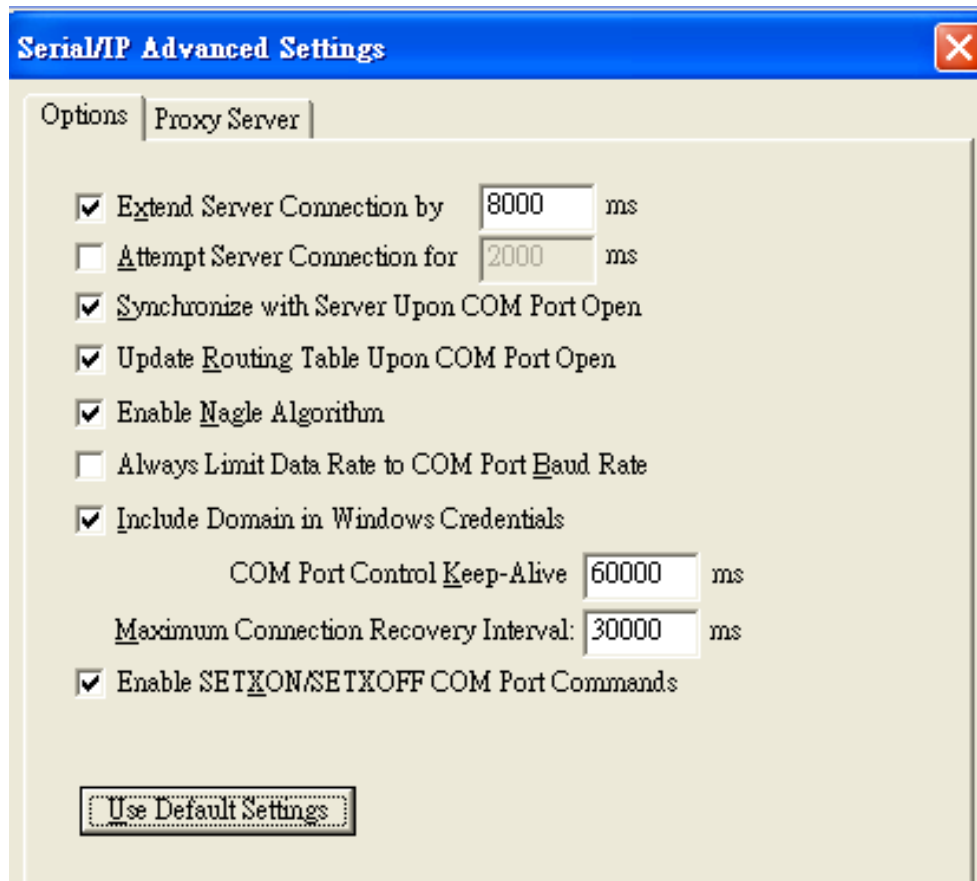


Figure 4.18 Serial/IP Default Advanced Settings

- **Extend Server Connection**
Maintains the TCP connection for specified amount of time after COM port is closed
- **Attempt Server Connection**
Terminates pending connection attempts if they do not succeed in the specified time
- **Synchronize with Server Upon COM Port Open**
Required by NT Systems (2000, XP, Vista, 7)
- **Update Routing Table Upon COM Port Open**
Maintains IP route to a server in a different subnet by modifying the IP routing table
- **Enable Nagle Algorithm**
Provides better network efficiency by imposing a minor latency on the data stream while it waits to fill network packets
- **Always Limit Data Rate to COM Port Baud Rate**
Limits the data rate to the baud rate that is in effect for the virtual COM port

■ **Attempt Server Connection**

If credential is set to Windows Credentials, VCOM automatically adds the current Windows domain to the username

■ **COM Port Control Keep-Alive**

Controls the interval at which VCOM will issue the keep-alive message, if no there is no activity

■ **Maximum Connection Recovery Interval**

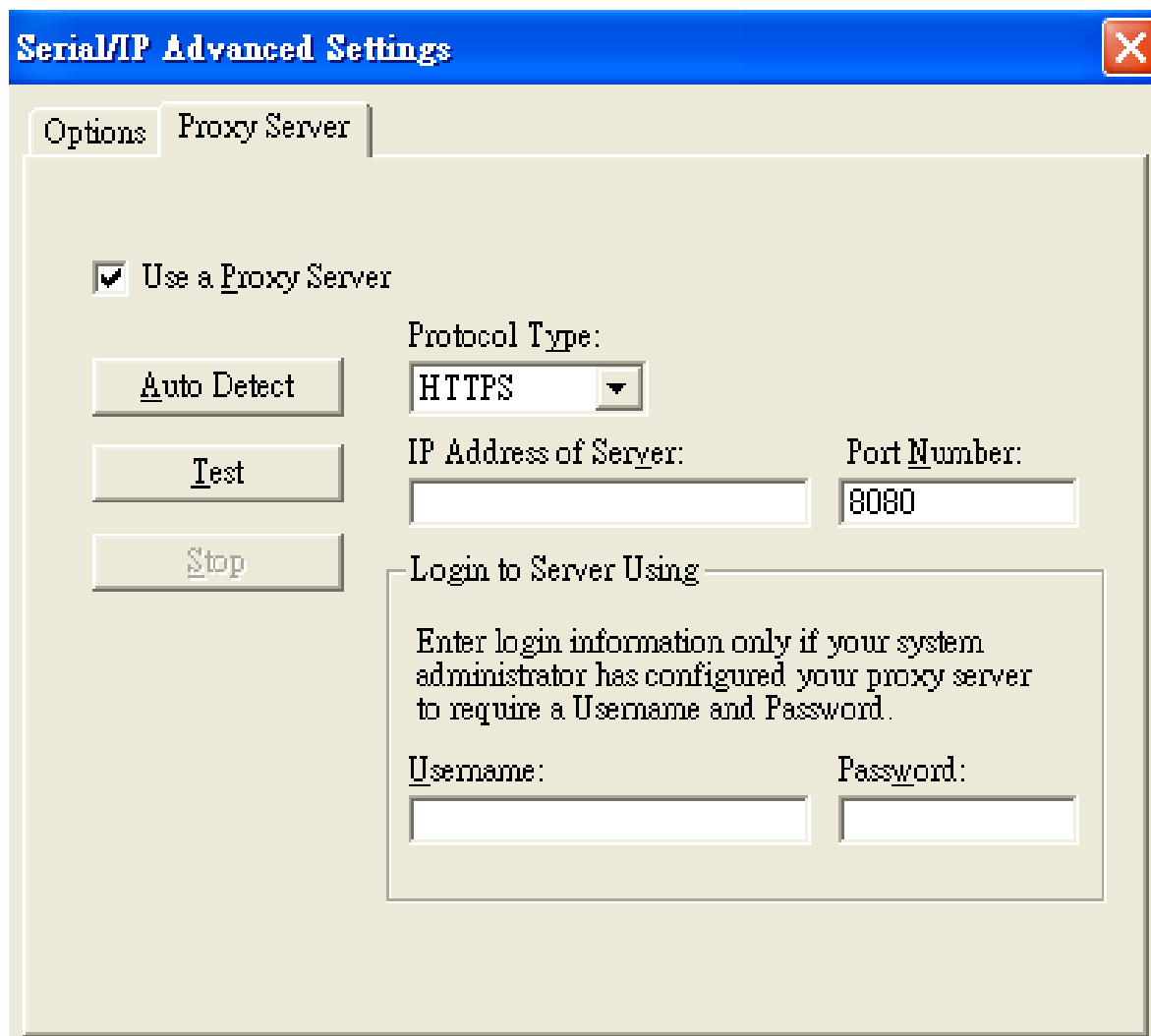
Controls the maximum time for "Restore Failed Connection"

■ **Enable SETXON/SETXOFF COM Port Commands**

This option enables additional negotiation on SETXON and SETXOFF commands and is only available for the "V" series serial device servers. If the application requires SETXON/SETXOFF feature, please contact Atop Tech Support.

4.6 Using Serial/IP with a Proxy Server

The Serial/IP Redirector supports TCP network connections made through a proxy server, which may be controlling access to external networks (such as the Internet) from a private network that lacks transparent IP-based routing, such as NAT. Find Proxy Server settings from the Advanced Settings windows and switch to the **Proxy Server** tab (Figure 4.19)



The image shows a Windows-style dialog box titled "Serial/IP Advanced Settings" with a blue header bar and a red close button. It has two tabs: "Options" and "Proxy Server", with the latter being selected. The "Proxy Server" tab contains the following elements:

- A checked checkbox labeled "Use a Proxy Server".
- Three buttons on the left: "Auto Detect", "Test", and "Stop".
- A "Protocol Type:" label followed by a dropdown menu currently showing "HTTPS".
- An "IP Address of Server:" label followed by an empty text input field.
- A "Port Number:" label followed by a text input field containing "8080".
- A section titled "Login to Server Using" which contains a paragraph of text: "Enter login information only if your system administrator has configured your proxy server to require a Username and Password." Below this text are two labels, "Username:" and "Password:", each followed by an empty text input field.

Figure 4.19 Serial/IP Proxy Settings

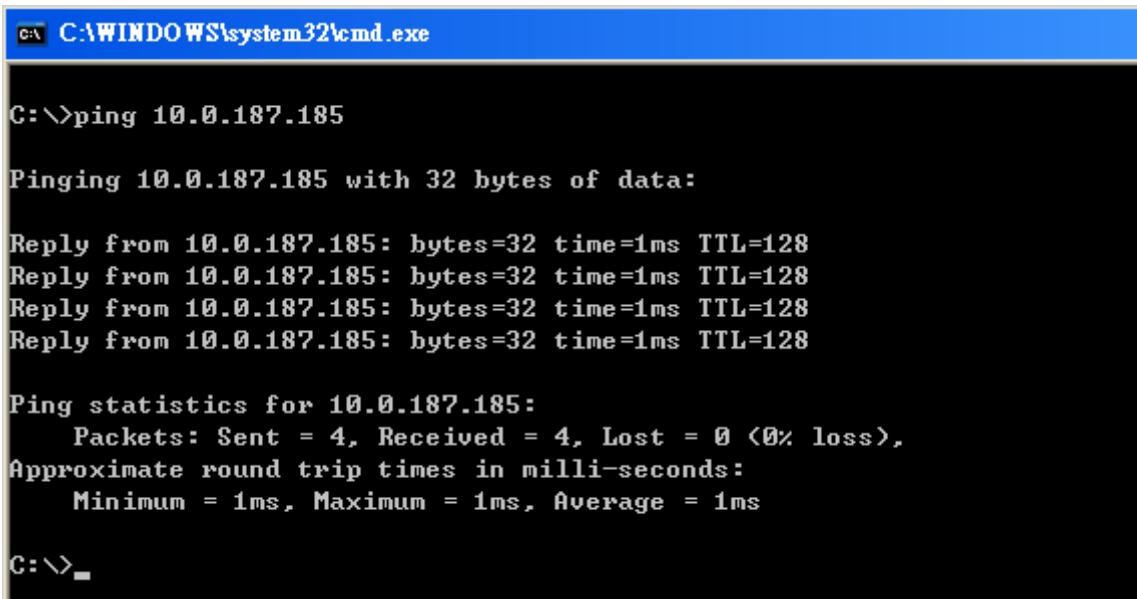
5 Diagnostics

There are several ways to can check the status and availability of the serial device server.

5.1 Using Standard Ping Command

From the Windows **Start** menu, select **Run** and type in “**ping <TCP Server IP address>**”.

If the serial device server can receive ping requests sent from the host, it will reply to the ping message (Figure 6.1). If the ping request cannot reach the serial device server, timed out message will show (Figure 6.2).



```
C:\WINDOWS\system32\cmd.exe

C:\>ping 10.0.187.185

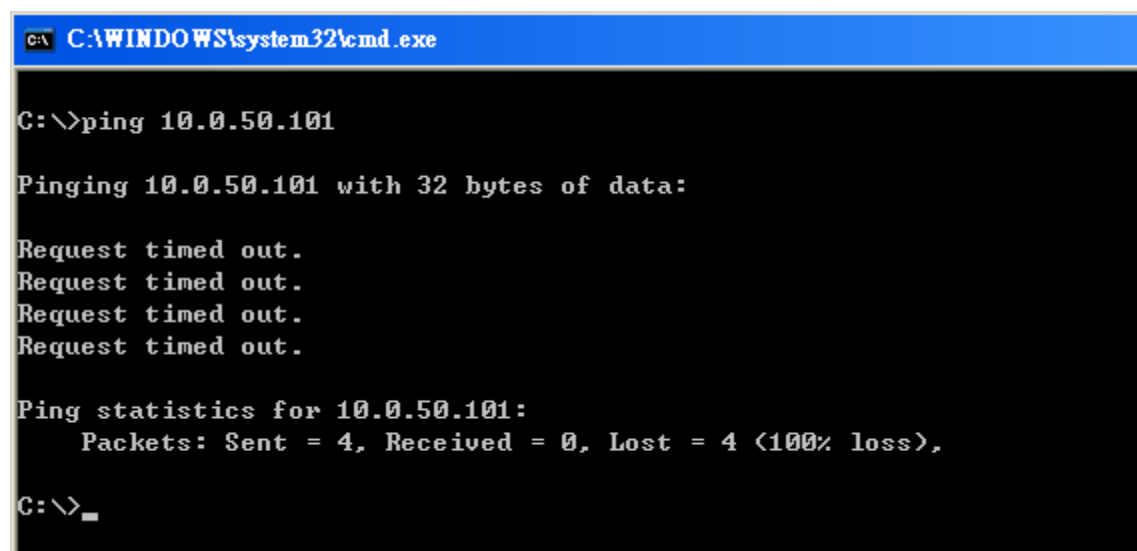
Pinging 10.0.187.185 with 32 bytes of data:

Reply from 10.0.187.185: bytes=32 time=1ms TTL=128
Reply from 10.0.187.185: bytes=32 time=1ms TTL=128
Reply from 10.0.187.185: bytes=32 time=1ms TTL=128
Reply from 10.0.187.185: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.187.185:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>_
```

Figure 6.1 Successful Ping Reply



```
C:\WINDOWS\system32\cmd.exe

C:\>ping 10.0.50.101

Pinging 10.0.50.101 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.0.50.101:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>_
```

Figure 6.2 Ping Command Failed

5.2 Using Serial Manager Configuration Utility

Use **Serial Manager** configuration utility that comes with the product CD or download from Atop website to check on the status of the serial device server. The status and version can be read from the tool. For example, 'S' means that COM1 is in TCP Server mode and is not connected to a TCP Client (Figure 6.3). 'A' means that COM1 is in server mode and is connected to a TCP Client.

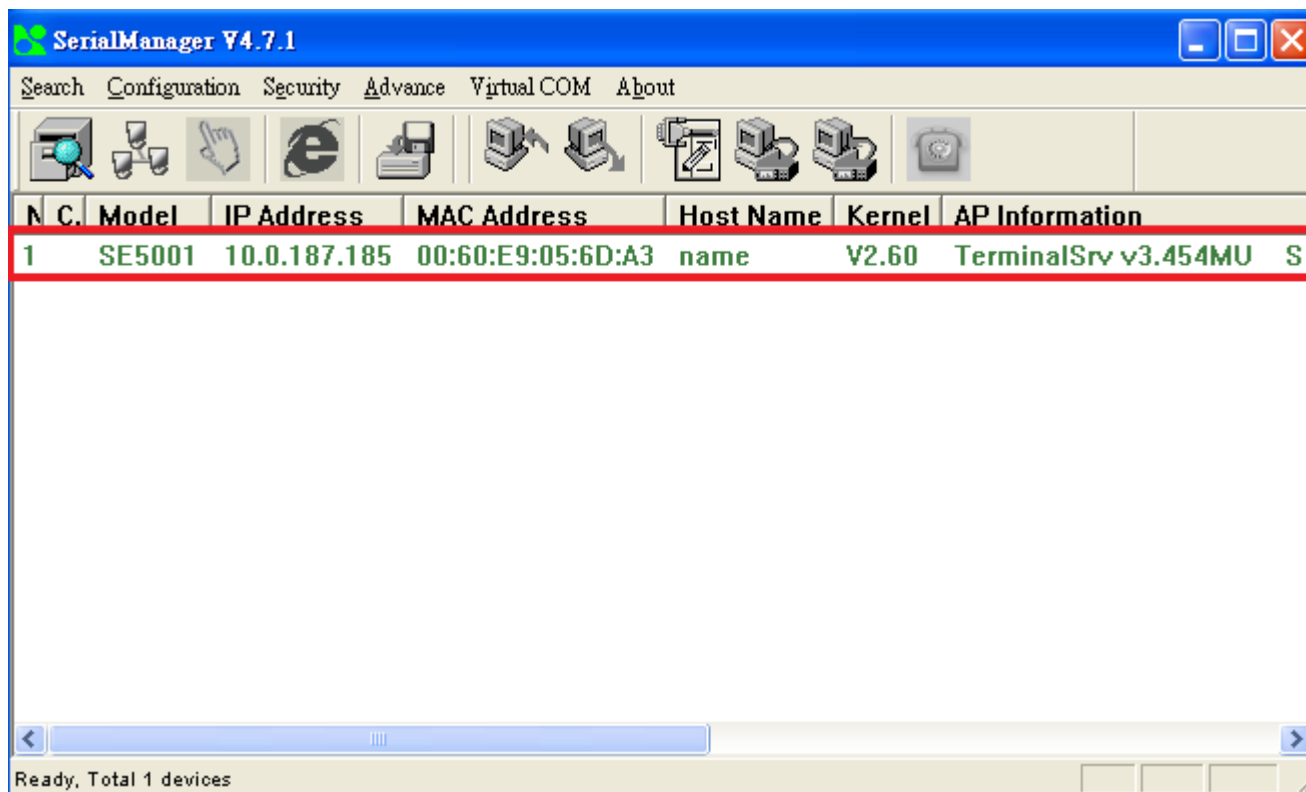


Figure 6.3 Serial Manager Utility

Appendix

Specifications

Network Interface	
Ethernet	1x RJ-45 IEEE802.3 10/100Mbps, Auto MDI/MDI-X
Serial Interface	
Connector	D-Sub9 RS-232/422/485 software selectable 3.81mm TB5 RS-232/422/485 software selectable (TB models)
Ports	1 Port
Baud Rate	1200~230Kbps
Data Bits	7,8
Stop Bits	1,2
Flow Control	None, Xon/Xoff, RTS/CTS
Power Characteristics	
Input Voltage	9VDC-48VDC
Input Current(9VDC)	0.30A
Power Consumption	Approx. 2.70W (max)
Reverse Polarity Protection	Yes
Connector	5.08mm 3-pin Lockable Terminal Block
Mechanicals	
Dimensions	75mm x 85mm x 28mm
Installation	Wall Mount, DIN Rail (optional)
Reset Button	Yes
Weight	200g
Environmental Limits	
Operating Temperature	0°C~60°C (32°F~140°F)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Ambient Relative Humidity	5~95% RH, (non-condensing)
Software	
Protocols	IPv4, ICMP, TCP, UDP, DHCP Client, SNMP, HTTP, Telnet, RFC2217
Configuration	Serial Manager, Web UI, Telnet
Virtual COM	Windows / Linux redirection software
Internal Buffer Size	TCP receiving buffer = 8K bytes, TCP transmitting buffer = 16K bytes Serial receiving buffer = 4K bytes, Serial transmitting buffer = 4K bytes

Link Modes	
TCP Server	4 connections, Virtual COM, or Reverse Telnet
TCP Client	Single destination or Virtual COM
UDP	Up to 4 ranges of IPs

Upgrade System Firmware

Firmware is available for download on Atop website: <http://www.atop.com.tw>. Subscribe to our RSS system <http://www.atop.com.tw/en/rss.php> to receive our latest firmware updates automatically.

Upgrade Procedures

This section introduces the command-line firmware upgrade utility included in the CD. Alternatively, use the GUI management utility Serial Manager to upgrade the system firmware. Refer to Serial Manager's manual to use Serial Manager to upgrade the system firmware.

After the new firmware is obtained, follow the procedures below to upgrade SE5001A.

1. Connect a PC (Windows systems) and the SE5001A to the same subnet. Use **ping** command or Serial Manager utility to verify its availability.
2. Locate **dapdl.cfg** (configuration file), **gwdl.exe** (download executable utility), and **download.bat** (download batch file) in the \download folder of the CD. Copy them to the system disk.
3. Locate the new system kernel and/or AP firmware to download. Move them inside the copied \download directory.
4. Double click on **download.bat** to start the firmware upgrade process.

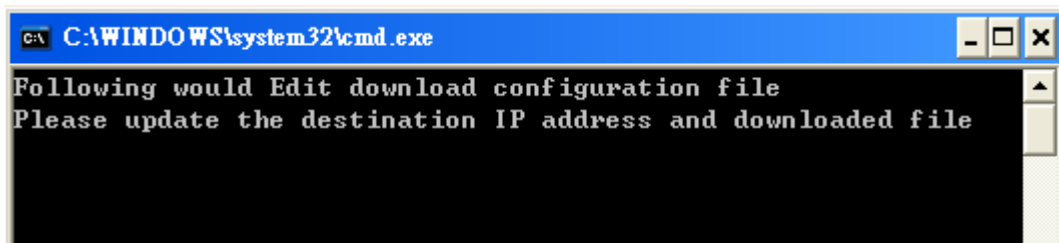


Figure B.1 Prompt of download.bat

Note: It is also possible to edit **dapdl.cfg** and run **gwdl.exe** manually without using the batch file **download.bat**.

5. Press any key to continue.
6. An editor will open **dapdl.cfg** automatically. Edit the content to match the IP address of SE5001A and the file name of the new firmware. "**dapdl.cfg**" has the following structure:

```
Remote_IP    10.0.50.100
Load         firmware.hex
```

The first line identifies the IP address of SE5001A, the second line identifies the name of the firmware (.Hex file) to be downloaded.

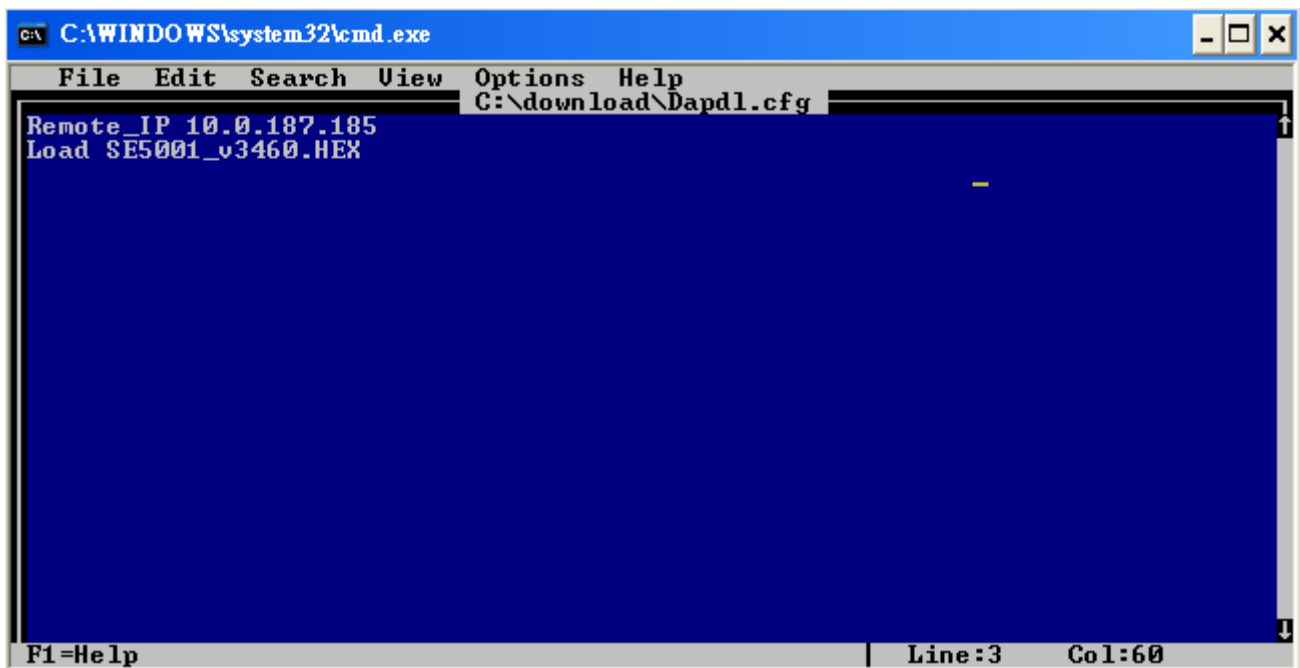


Figure B.2 Dapdl.cfg Opened with an Editor

7. File->**Save** and File->**Exit** the text editor.
8. Enter the admin as the userid and the password of SE5001A. If a password is not set, press enter. The batch file will upgrade the system firmware. SE5001A will restart automatically after the new firmware is uploaded.

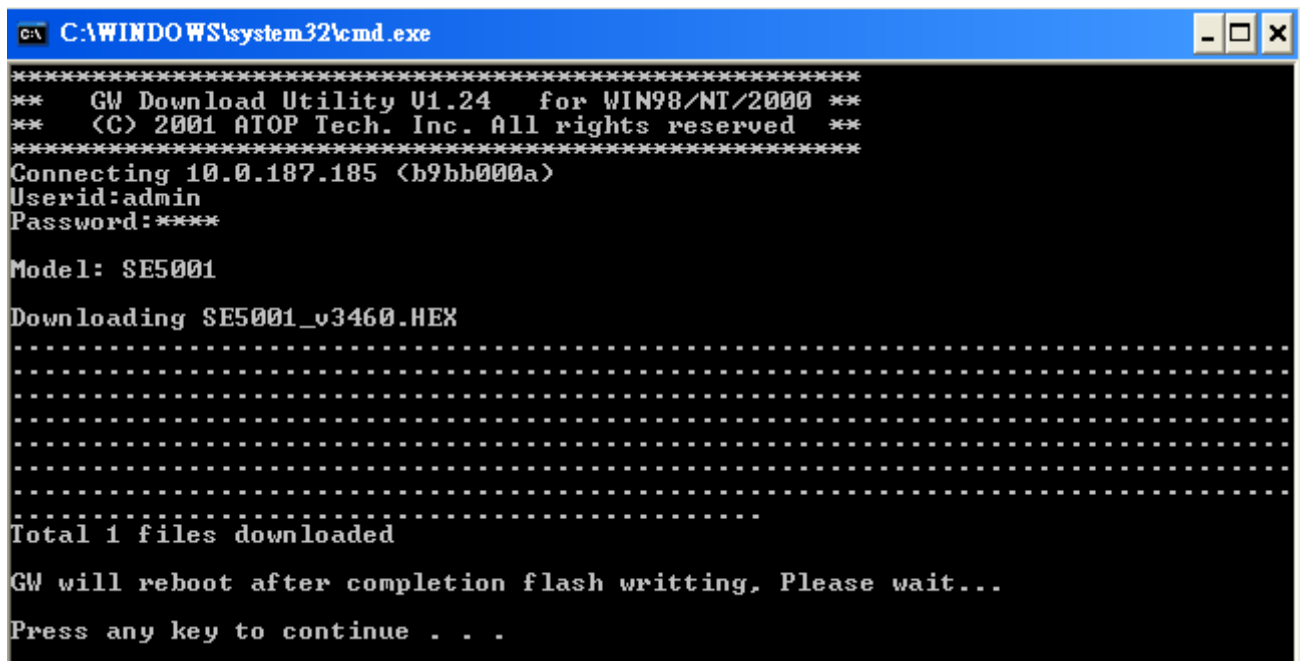


Figure B.3 System Firmware Upgraded

9. Repeat the process above again for kernel or AP firmware if necessary.

Note: After the upgrading process finishes, SE5001A will program the flash memory and buzzer beeps 6 times then restarts. Normally, it takes around 10 seconds to complete the programming process. If an error occurs during the programming process, SE5001A will clear the corresponding memory and the system remains intact of what it was.

Error Messages

Firmware upgrade may not be successful if errors occur during the process.

Error Cause	Message	Comments
Illegal Hex file format	<ul style="list-style-type: none">■ Hex File Text Error■ Hex File Check-Sum Error■ Hex File Format Error■ Hex File End of Record Error	
SE5001A handshaking problem	<ul style="list-style-type: none">■ SE5001A ACK Start Address Error■ SE5001A ACK Length Error■ SE5001A Response Command Error	
Configuration file	<ul style="list-style-type: none">■ Remote IP not found■ Open configuration file failure	

Emergency Firmware Recovery

The AP (application program) firmware of SE5001A can be disabled to restore the device to the proper firmware in case an incompatible firmware was downloaded and the system crashes while loading the AP.

To disable the AP firmware and prevent it from executing, please do the following.

1. Power off the device.
2. While the reset button is pressed, power on the device.
3. In Serial Manager, SE5001A will show up with a default kernel firmware and no AP firmware.
4. Download the correct AP firmware to SE5001A.
5. The device will restart and recover to the downloaded firmware.

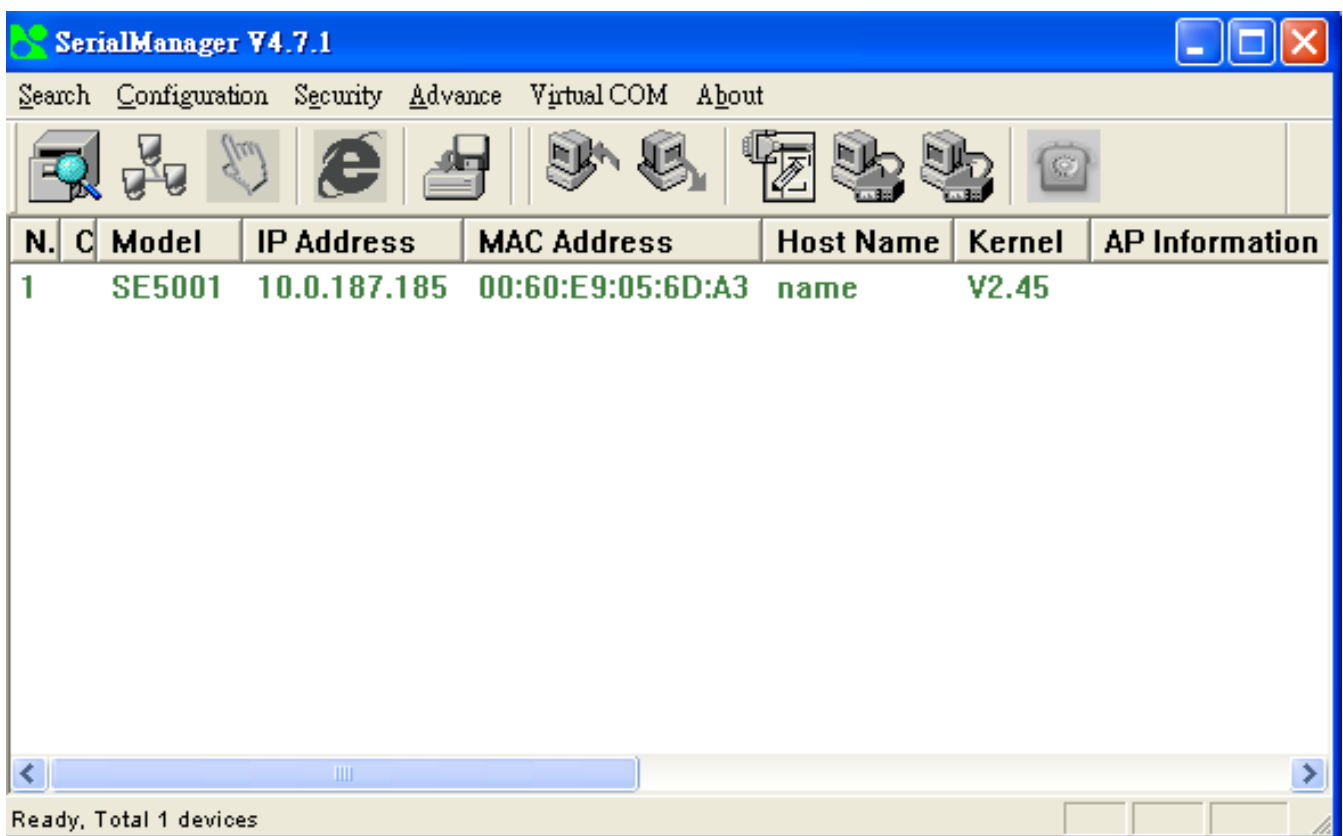


Figure C.1 SE5001A with no AP firmware disabled